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IDG UNITED KINGDOM

JIM MARTIN



Boosting security

Keeping your PC secure has never been more important

Welcome to the May issue of *PC Advisor*. I don't know about you, but I don't think too hard about PC security these days. I run anti-virus on all my PCs and rarely hear from it, unless it needs a major version update. However, as you'll read on page 64, the landscape has changed radically from when viruses were the main threat. Security should be at the forefront of your mind more than ever, because these days it's your personal information that's at risk, not just the files on your hard drive. Modern internet security suites do a whole lot more than blocking viruses, and you'd do well to read the reviews and decide if your current protection is good enough.

This month we've also put a bunch of the latest budget graphics cards through their paces to find out whether you really need to spend the equivalent of a new Xbox or PlayStation to play 3D games on your PC. And the good news is you don't. For less than £100, you can upgrade your PC with an AMD or nVidia card that will cope with the latest titles – perhaps not at their maximum quality – but far better than your current graphics card. Plus, since most take their power from the slot on your motherboard, you shouldn't need to upgrade anything else. Turn to page 70 to find out which card to buy.

We've also been busy – as ever – reviewing the latest PCs, laptops, smartphones and tablets, plus all the gadgets that go along with them, including the best all-in-one inkjet printers, so if your printer needs replacing, turn to page 60 to see what's on offer for under £100.

Among the great tutorials starting on page 108, you'll find our guide to streaming content from your PC to a TV, so you can watch videos and photo slideshows from your hard drive or online. If you want to play PC games on your TV there's a solution to that, too, in the form of NZXT's new Doko streaming box: you'll find the full review on page 45.

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Not everyone will get Windows 10

Microsoft gives up on Windows RT and backtracks on Lumia upgrade promise

It looks like the end of the line for Windows RT as Microsoft ends production of devices including the Lumia 2520. The company recently confirmed it would no longer manufacture any more Surface 2 tablets. Now it has done the same with the Nokia Lumia 2520, another Windows RT tablet.

"We are no longer manufacturing Nokia Lumia 2520; however, those still eager to buy Nokia Lumia 2520 should visit Microsoft Retail Stores, MicrosoftStore.com, third-party retailers and resellers for the latest availability," a spokesperson explained.

Microsoft was the last remaining manufacturer of Windows RT devices, so this signals the end of the ARM-based half of Windows which we all knew would come eventually. Partners such as Acer, Asus, Dell, Samsung and Lenovo all backed Windows RT to start with but quickly pulled out.

In 2013 Toshiba commented on RT saying: "For the time being, Toshiba will focus on bringing Windows 8 products to market. We will continue to look into the possibility of Windows RT products in the future while monitoring market conditions."

Of course, Microsoft hasn't said outright that it won't make any more in the future, but it seems highly unlikely with the focus



now firmly on Windows 10, which will run across all devices including small tablets and phones. It has said it is working on a separate update for Windows RT, which will include some Windows 10 functionality.

Back in November of 2013, Julie Larson-Green, EVP of Devices for Microsoft, admitted the firm had too many operating systems and wouldn't have three going forward. Currently, Microsoft has Windows, Windows RT and Windows Phone.

Commenting on the difference between full Windows and Windows RT, she said: "I think we didn't explain that super-well. I think we didn't differentiate the devices well enough. They looked similar. Using them is similar. It just didn't do everything that you expected Windows to do."

Not all Lumia phones to get Windows 10 upgrade

Microsoft has announced that Windows 10 will arrive on smartphones, but that not all Lumias will get the software upgrade.

The company has already admitted that the Surface RT won't be upgraded to Windows 10 and it has now said that not all of its Lumia smartphones will either – despite saying the new operating system has been designed to run well on 'today's' Lumia phones.

"Our goal is for the majority of the Lumia phones running Windows Phone 8 and 8.1 to join the Windows ecosystem along with an expected hundreds of millions of PCs, tablets and other devices running the next generation of Windows," said the firm on the Lumia Conversations blog (formally Nokia Conversations).

In the blog post, Microsoft confirmed an update will be available for the Lumia 435 (pictured), 735 and the gold-edition 930. It gave live demonstrations of features at the launch event on a Lumia 1520.

The news may be a shock for some. As last as November last year, the company announced via the Lumia Twitter account that: "We plan to upgrade all Windows Phone 8 devices to Windows 10 in the future :).".

"Like any upgrade to a new platform, not every phone will upgrade or support all possible Windows 10 features, and certain features and experiences will require more advanced future hardware."

So it remains unclear exactly which devices (beyond the three named above) will get upgraded to Windows 10. The above statement suggests that budget devices are less likely to be included while more premium Lumias should be able to handle the new firmware.



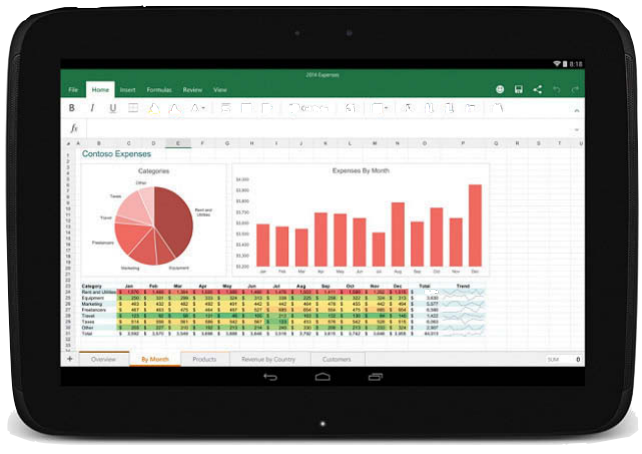
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Microsoft launches Office for Android

CHRIS MARTIN





Office for Android is here, but can your tablet run it?

Microsoft has launched the final version of Office for Android. Word, Excel and PowerPoint are available to download for free from the Google Play store.

After running semi-public betas for two months and posting previews to the Play store, Microsoft Office in its finished form has finally arrived. The programs are designed to be 'unmistakably Office' while optimised for Google tablets. To this end they include the Office ribbon with which desktop users will be familiar.

"Similar to Office for Windows 10, Word, Excel and PowerPoint for Android tablets are built from the ground up for touch and are perfect for mobile productivity," said Microsoft.

As long as you have a Microsoft account, you can use the Office suite for free if it's for personal use and you stick to core editing. However, premium features require an Office 365 subscription. Commercial use requires a subscription for both.

"Large touch points make it easy for even the fattest of fingers to navigate commands. External keyboards can be connected but certainly aren't needed," added the firm.

Although the apps are available to download and use for free, you'll need a compatible device – one with at a 7in screen or larger. If you have a 10.1in tablet, you'll need an Office 365 subscription. Furthermore, you'll need a device with an ARM-based processor, have at least 1GB of RAM, and be running Android 4.4.x KitKat. Lollipop tablets will run the software, though, it won't be officially supported until a future update is released. If you're running an Intel chip, then Microsoft promises support for you via a "native implementation", which will be available within three months.

Qualcomm chips bring faster LTE to budget phones

Qualcomm's next Snapdragon 620 and 618 are 64-bit smartphone chips using ARM's Cortex-A72 CPU

Qualcomm is planting the seeds for 4K video and faster LTE speeds in more affordable smartphones with its new Snapdragon 620 and 618 processors. They are expected to be available in the second half of this year.

The new chips could be in smartphones costing just £200. Some performance and 4K features are being cascaded from the Snapdragon 810, which goes into premium smartphones priced above £400.

The 600 series chips will support Android and Windows, revealed Tim McDonough, Qualcomm's vice president of marketing.

Although smartphones don't have 4K screens, they are becoming devices through which ultra-high-definition videos or games can be streamed to larger screens, explained Bob O'Donnell, principal analyst at Technalysis Research.

Qualcomm's chips will bring those capabilities to mainstream smartphone users, who currently would have trouble finding 4K in handsets priced between £150 and £300, O'Donnell added.

The new 64-bit Snapdragon 620 and 618 chips are based on the ARM Cortex-A72 design, which was announced earlier this year. The Cortex-A72 is considered ARM's most powerful chip design and is roughly three-and-a-half times faster than the current 32-bit Cortex-A15 design.

The eight-core Snapdragon 620 has four Cortex-A72 CPUs and four Cortex-A53 cores. The six-core Snapdragon 618 combines two Cortex-A72 cores with four Cortex-A53 CPUs. The lower power Cortex-A53 cores are for background tasks such as taking phone calls and playing MP3 songs.

The Snapdragon chips have the Adreno 405 graphics processor, which is able to process 4K video for display on larger screens connected to handsets. The chipset supports two 13Mp cameras and can capture and play 4K video based on the H.265 format.

An integrated LTE modem will work in different parts of the world. It will have maximum speeds of 300Mb/s for downloads and 100Mb/s for uploads. The Snapdragon 620 and 618 chips will support LTE Broadcast and VoLTE (Voice over LTE).

Qualcomm also announced new eight-core Snapdragon 425 and 415 chips, which are for "high-volume" smartphones, which could mean low-cost smartphones under £150. The chips are based on 64-bit ARM CPU cores and have faster LTE connectivity compared to previous 400 series chips.



Sony Bravia TVs to come with built-in YouView

Sony has confirmed that its 2015 range of Bravia TVs will have YouView built in. The popular Freeview service will be available on both Full HD and 4K models starting this summer.

YouView is available from BT and TalkTalk as a set-top box, but consumers can also buy models at selected retailers. It offers catch-up services including BBC iPlayer, 40D, ITV Player and Demand 5.

Richard Halton, CEO, YouView said: "This exciting YouView and Sony partnership will create a deep integration of YouView's functionality within the new Sony TV range, built on the Android platform."

MORE: tinyurl.com/ndrwvh7

Samsung responds to 'eavesdropping' Smart TVs story

It's emerged that Samsung's Smart TVs might be recording things users say in the privacy of their own home and sending it to third parties. Samsung said that the security breach could theoretically happen only when a specific combination of buttons is pressed.

The company has said in a statement that it takes privacy issues "very seriously" and employs numerous safeguards to prevent the unauthorised use of consumer data.

Privacy is an increasing worry for consumers as more and more devices connect to the internet and contain hardware such as cameras.

MORE: tinyurl.com/q3htx29

Sky to offer mobile phone contracts

UK telecoms shake up continues as Sky strikes deal with O2

With BT in the process of acquiring the UK's biggest network, EE, Sky has responded with its own deal. Telefónica, which owns O2 in the UK, will give Sky access to its 2-, 3- and 4G services.

"As the UK's leading brand for home entertainment and communications, Sky has a proven ability to launch new services, at scale. We know our 11.5 million customers trust Sky to offer them the best quality and choice and have an appetite to take more from us," explained Jeremy Darroch, Sky's group chief executive.

This year is set to see a major shift in the UK telecoms market, with BT buying EE and Three taking over O2. Quad-play – providing TV, broadband, home phone and mobile – is becoming increasingly important and this is what Sky will be able to do in 2016 in order to compete with BT and Virgin Media.

With big competition in this area, it's surprising that Sky won't launch its mobile service until next year, giving BT a head start. Almost 40 percent of Sky's customers are on triple-play contracts, but it may not have as much luck with mobile.

"Sky may initially struggle to sell mobile services to its customers given that most, if not all, will have



an existing mobile service provider. Its offering will have to be extremely competitive from the outset and Sky must clearly articulate its merits compared with rival options," argued analysts CCS Insight.

Sky will be in a decent position, but CCS Insight believes there will be more moves this year. It added that the broadcasting company is a takeover target for Vodafone, which has cash after selling its share in Verizon Wireless for $130bn.

Freeview Play service to take on YouView

Freeview Play is arriving later this year with BBC iPlayer, ITV Player and All 4

Freeview has announced a connected TV service called Freeview Play to rival YouView. The firm says that it hopes it will be the "new normal way to watch television".

The popular digital TV service has undergone a 'major' rebrand for the launch of its new service. Freeview Play is set to launch later this year and will take on YouView by offering a range of catch-up and on-demand services.

Guy North, managing director of Freeview, said: "Our new brand identity is bold and contemporary and will stand out in what is a very crowded TV market. Today marks the start of an exciting future for the Freeview brand."

The firm, run by BBC, Sky, Channel 4, ITV and Arqiva, said that Freeview Play will be subscription-free and available via a range of new TVs and boxes which customers will connect to their broadband to access content.

Freeview Play will offer BBC iPlayer, ITV Player and 4OD (which will soon become All 4). Like YouView, users can search for shows by scrolling back on the guide or via the apps page. Sony's 2015 Bravia TVs will come with YouView built-in.

The firm will want to add more services to that list in order to compete with YouView, which offers the aforementioned, plus Demand 5, Quest, Netflix, Sky Now TV, Sky Store, Milkshake, UKTV and S4/C. As well as YouView, Freeview Play will have to take on set-top boxes and gadgets such as the Apple TV, Roku, Google Chromecast and Amazon Fire TV.

"In the same way that we took the UK from analogue to digital, Freeview Play is the next step in that vision and it will put the viewer in control, without complexity, commitment or unnecessary cost – we want to keep television fair and open for everyone," added North.



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The Ubuntu phone is doomed

Why the Ubuntu phone can't compete with the big boys

Ubuntu OS for phones was announced in January 2013, over two years ago, and the device is only just coming to market. In fact, it was confirmed in 2011 that the OS would support smartphones, tablets, TVs and smart screens. Nevertheless, the first Ubuntu phone has at long last arrived, but I don't think it's going to succeed.

Of course, there will be hard core fans of Ubuntu who will be desperate to get their hands on the device. The first flash sale was only about half way through when the device became out of stock, but we could be talking very small numbers here. I wouldn't be surprised if the number available was deliberately low in an attempt to create hype and demand. Something 'sold out' must be popular mustn't it?

Beyond the Ubuntu fans (and I welcome your comments), I don't think that the Ubuntu phone(s) will make a dent on the already saturated and heavily contested smartphone market. Here are the four key reasons behind my opinion.



Price

Let's start with price. The first Ubuntu phone is the BQ Aquaris E4.5 Ubuntu Edition and it costs €169 (£124).

Initially, the idea of an Ubuntu phone undercutting other devices on the market sounded like a great idea. However, it's taken so long to launch the phone that this price tag no longer seems attractive. It's cheap, sure, and free shipping and a bundled case seem attractive but the phones available for under £150 are seriously good now (some of them) so the competition is stiff.

A phone can't simply be cheap anymore, it's got to tick a number of boxes to be worth buying and I'll explain how it can't match up to rivals below.

Branding

Ubuntu is a well-known brand, but I think the firm is going to struggle to get the average consumer to buy into an unknown smartphone brand in BQ – in the UK at least. I review smartphones for a living and I barely know anything about the company. It's in the top 10 in Spain according to Strategy Analytics, but that doesn't count for much elsewhere.

Consumers in the UK have struggled to accept new brands such as Huawei and ZTE, preferring instead to stick with what they know in the likes of Apple, Samsung, Sony and HTC to name just four. Recently, we've seen Huawei launching devices under a new 'Honor' brand to try and solve this problem.

Ubuntu using BQ as the manufacturing partner presents a huge barrier for consumers to get over.

Hardware

Although there may be more Ubuntu phones in the future, I can only compare the Aquaris E4.5 Ubuntu Edition with rivals for now.

For starters, this is one boringly ugly block of a phone with chunky bezels and nothing of interest whatsoever. Design is important for a very personal device such as a smartphone, and things get worse when you start to compare the hardware on offer with the best of the budget market.

The BQ Aquaris E4.5 has reasonable specifications for the price, and while I applaud the inclusion of an 8Mp rear camera and microSD card slot, one of the best budget smartphone around at the moment is the Moto G 4G and it comes out on top.

Motorola's budget smartphone is a similar price and although some specs are the same and the rear camera is a lower resolution, it comes with a higher resolution screen and that all important 4G LTE support.

Software

For some, having Ubuntu will be a massive lure and the main reason to buy this phone (or future devices running the OS). For those people, I'm glad the launch has finally arrived; I hope you get your hands on one and I hope you enjoy it.

The wider smartphone market, however, is a different story. You probably don't need me to tell you how established iOS and Android are. Even Microsoft is finding it hard to compete with its Windows Phone operating system, so is there room for a fourth mobile OS? There are a few vying for that spot including Tizen, Jolla and Firefox, but the short answer is no.

There may be some interesting software features like navigation but Ubuntu has no established app store. Apps are seriously important and there's limited developer support to make things worse.

Conclusion

For a few fans, the long wait for the Ubuntu phone is over, but the firm has taken such a long time to reach the market that competition is far too fierce to make any real impact. The device looks uninteresting, isn't cheap enough to undercut budget Android and Windows Phone enough, can't compete on specs (namely 4G) and doesn't have enough on the software side to convince users to switch.

CHRIS MARTIN



Windows 10's success is guaranteed

Everyone's going to love Windows 10 and Microsoft is going to rule the world forever. Probably

The history of Windows in terms of user popularity is the very definition of peaks and troughs. Ever since Windows 95 the platform that is part of so many people's lives has been loved or barely tolerated, but rarely anything in between. And Microsoft seems to have settled into a binary habit of reaching for the stars with an initial, unpopular release, and then fixing the problems with the follow up.

Windows 95's great leap forward was an over promise of epic proportions, fixed in Windows 98. The Windows 2000/Me epic fail was resolved in the shape of the now beloved Windows XP. When Vista proved to be a shocking mass of feature bloat, security woes and instability, Microsoft released 'Windows 7' (in essence Windows Vista, but no longer broken).

Throughout this period Microsoft was able to charge for the upgrade, with diminishing levels of success. Each time it was offering either a potentially exciting new feature set, or the resolution of problems with the current install.



Not about software upgrades

The main game is not software upgrades, of course. Up until the Vista debacle every new Windows launch kickstarted the hardware buying cycle, and that is where Microsoft really cashes in on Windows. And the fact that a new Windows no longer means a field day for PC makers has less to do with the quality of the operating system, and more to do with the longevity of hardware, and the creeping (and then gushing) success of smartphones and tablets. We just don't replace our PCs and laptops anything like as often, regardless of what version of Windows we have.

So now that Windows 8 is largely disliked, and Windows 10 is intended to resolve those problems, Microsoft has made the sensible decision to offer the upgrade for free. If you are a Windows 7 or Windows 8 user you can upgrade your PC, laptop, tablet or even smartphone to Windows 10. Hurrah!

It is typical of Microsoft that – without elegance – it has landed on the correct commercial strategy here. This is the organisation that first worked out how to get rich from software, after all.

The fact is that even if some people could have been persuaded to buy an upgrade to Windows 10, it would have been a relatively insignificant financial bump for Microsoft. It makes its real money from OEM sales of hardware, as well as Office and enterprise software. For Windows 10 to be a success, it needs the software to drive hardware sales. And who is the best at using software to drive hardware sales?

Why it is Apple, which also gives away its operating system upgrades.

Driving sales the Apple way

Apple learnt not so long ago that if you allow people to upgrade for free they will tend to do it. This means that most of your user community is on the same platform. This in turn makes it easier for third-party software and peripherals makers to upgrade their products, which increases the rate at which older hardware becomes 'obsolete'. (Not obsolete at all, of course, just marginally more painful to use: if you can't get printer drivers, and your favourite game no longer works, you may decide it is time to upgrade.)

For Microsoft the potential gains here are bigger, too. It has a wider range of products to shift: everything from cheap laptops to workstations, from tablets, hybrids and ultraportables to smartphones and games consoles. And, yes, its own music, movies and games stores, and in Xbox Live its own social network. The more people Microsoft can get using Windows 10 the more opportunity it has to turn them on to the benefits of buying additional Windows-using devices, as well as upgrading their current gadgets.

There are plenty of people who will tell you that Microsoft and/or Windows is doomed. It's possible they are correct, but I disagree. I think that Microsoft has a great history of making piles of cash from objectively inferior products, and Windows 10 is far from the worst of those (I tend to think it will be a neat piece of code, but that is my personal view).

Windows 10: you love it

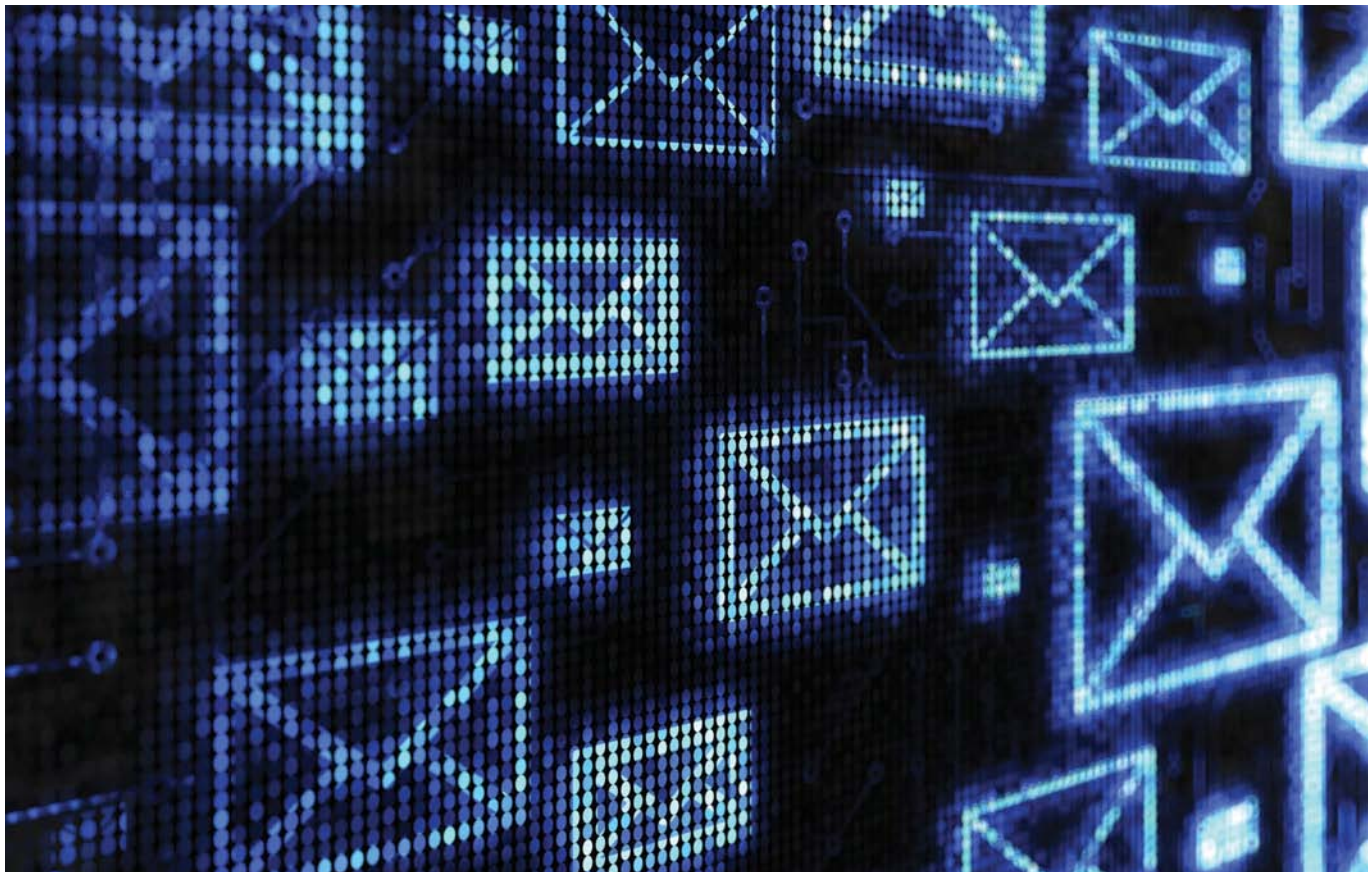
The early evidence backs me up. Before the recent Windows 10 event we asked readers of the *PC Advisor* website whether they intended to install the beta of Windows 10. Yes, these are tech savvy early adopters, but 29 percent of the almost 3,000 respondents said that they did intend to do so. A further 26 percent said they would be waiting until the final Windows 10 code and then installing that, and 17 percent said they would wait to learn more about it. Remember this is before we knew it would be a free upgrade. At least 55 percent, and potentially more than 70 percent were already good to go with Windows 10.

Fast forward beyond the launch and we asked readers in which of the new features they were interested in. Only 11 percent of the (so-far) 2,000 respondents said they weren't interested in the new features of Windows 10, and a staggering 71 percent said that they liked the fact the upgrade is going to be free. It's hard to argue with that price.

We're set to see huge uptake of Windows 10 across myriad types of device. And that in time will lead to a massive hardware upgrade cycle. Microsoft will never again enjoy the dominance that it has seen at times in the past decade, but with Windows 10 it is very far from dead. ☒

MATT EGAN





Email security is everyone's job

You don't ever deserve to get hacked, but you can help yourself to stay secure

Recently, I awoke to the musical chiming of multiple text messages. They came from a variety of people, all concerned.

Some of them were worried that I was lost without cash or papers, in Turkey (of all places). But most were worried that my email had been hacked. In fact, it was my parents' email account that had been hacked for the second time in a fortnight. And the email that was being sent from their account carried my name and contained one of those phishing messages asking the recipient to send money. (For the record: if ever I need urgent help, I won't send an email. Any more than I'd send a postcard or a carrier pigeon.)

This kind of account hack is annoying, but not unusual. And it's not personal: but the personal nature of the message makes it feel that way.

My (pretty tech savvy) mother asked me why 'they' would be targeting her. Of course no-one is targeting anyone, it is just that my parents' entirely reasonable tech habits leave them open to this kind of attack. I know that my folks have unguessable passwords, but my Dad likes to forward on round-robin emails containing jokes or 'warnings' about the latest scams. And although they have security software installed, they both access their shared email from multiple laptops, without always being entirely vigilant about scanning and updating those devices.

None of this renders them worthy of blame, but it is why everyone in their inbox woke up to the 'news' that I was desperate for money, ligging around outside a kebab shop by the Bosphorus.

How not to get hacked

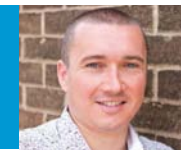
You need to be disciplined to respect the pitfalls of using email. Email as a medium has to be treated with the same attention to nuance as is letter writing. And I seem to remember being told repeatedly by children's TV presenters in the 1980s that chain letters were a bad thing.

This is not new information, but if you don't know the individual who originated a message, you shouldn't open it, never mind pass it on. This is how spammers find out live email addresses, and by forwarding such emails, you are exposing your friends and family to attack. Clicking the links contained within such emails is also the way that much malware is installed: the kind of malware that hacks your emails and uses your PC as part of a botnet to send out spam.

Anyone can be taken in by phishing and social engineering. Literally, anyone. There is no point being smug about it. But disciplining yourself to ignore forwards and mail from strangers will help you avoid it. And for the times when you are caught out, as well as changing your email password you need to make sure that the computers from which you access your email have not been compromised. A deep scan with up to date security software is required.

I'm certain this is what happened to the older Egans. The initial hack would have been a social engineering trick – one of them will have clicked a link on an email forward. They dutifully changed the password, but the infection was deeply rooted on one of their PCs. And so the spam rose again, and I was banished to the gateway between east and west. Lucky I like Turkish food.

MATT EGAN





I'm bored of the Apple Watch

We've had to wait for so long for the Apple Watch to arrive that I'm bored of it already

Apple first unveiled the Apple Watch at a special event in September 2014, but it won't be available to buy until the spring of this year, according to CEO Tim Cook, and that might not even be in the UK. So that's a wait of at least eight months, which to me seems like far, far too long. The Apple Watch is old news already, and I haven't even tried it yet.

I completely understand why Apple wanted to unveil the Apple Watch last year, even though it wasn't ready to go on sale yet. Wearables were all-the-rage already and Apple wasn't seen to be in the market, so the company wanted to make sure everyone knew that it was working on something amazing that has the potential to shake things up a bit, even if that wouldn't be until mid-2015.

But even then I felt like Apple was a bit late to the game, and who's to say that the Apple Watch is going to do what the iPod did to MP3 players and the iPad did to tablets? For one, rivals including Samsung, LG, Google, HTC, Sony and Motorola have launched very successful smartphones in the past year, boosting Android's smartphone market share to more than 80 percent (iOS is less than 12 percent). And, of course, the Apple Watch won't work with Android.

Apple's rivals have made big efforts with their many different smartwatches and yet none of those have taken off in the way I expect they'd hoped. I don't know anyone with a smartwatch aside from some tech journalists in the office (they don't count – they're paid to wear them), and I've seen only one out in the wild in the past two years.

Apple must be confident that its smartwatch is going to change things, and make us all want to be seen wearing a wrist-mounted computer, but right now I'm struggling to share that confidence myself.

Even Apple founder Steve Wozniak lacks enthusiasm for the Apple Watch. Woz himself has owned several smartwatches already, but he's already got rid of them, because he found himself going back to his phone regularly for the larger display. According to Woz, the Apple Watch is just a "luxury fitness band," and with a price tag that starts at £300 and could reach all the way up to £3,000, luxury is certainly accurate.

Rivals from the likes of Motorola, LG, Sony and Samsung are generally under £300, and some are under £200, including the brilliant LG G Watch R and the Motorola Moto 360.

So it's going to be expensive, potentially not as useful as everyone might hope, and it's only going to work with 12 percent of the smartphone market. Plus, as it was unveiled so long ago, we've had plenty of time to think long and hard about whether or not we should buy an Apple Watch.

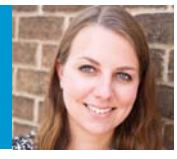
We now know that we'll have to charge it every single day, we've had more time to realise that smartwatches are not as awesome as we'd imagined, and we've had plenty of time to take a look at the Apple Watch's rivals and pick them apart to see how they compare.

If we'd been kept in the dark about the Apple Watch, we could have continued to enjoy speculating over how amazing it would be. It might have prevented those who really do want a smartwatch from buying one from the competition just in case the Apple Watch blew them all out of the water. And we wouldn't have examined every detail of the Apple Watch and discovered its downfalls long before we've even got it in our hands.

What's more, we've stopped talking about it. When the Apple Watch was unveiled, everyone was nattering and the buzz surrounding it was perfect for an imminent launch. But eight months later is far from imminent. Now, that buzz has died down to nearly nothing, because everyone's said everything they want to say about it.

I hope I'm wrong, and that I get excited about the Apple Watch again when it arrives in April, and that everyone else does too. But right now, I'm just bored of waiting.

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8.1 Windows Microsoft



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8.1 Windows Microsoft



3XS Graphite LG156 Gaming Laptop

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8.1 Windows Microsoft



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8.1 Windows Microsoft

Scan Computers recommends Windows.

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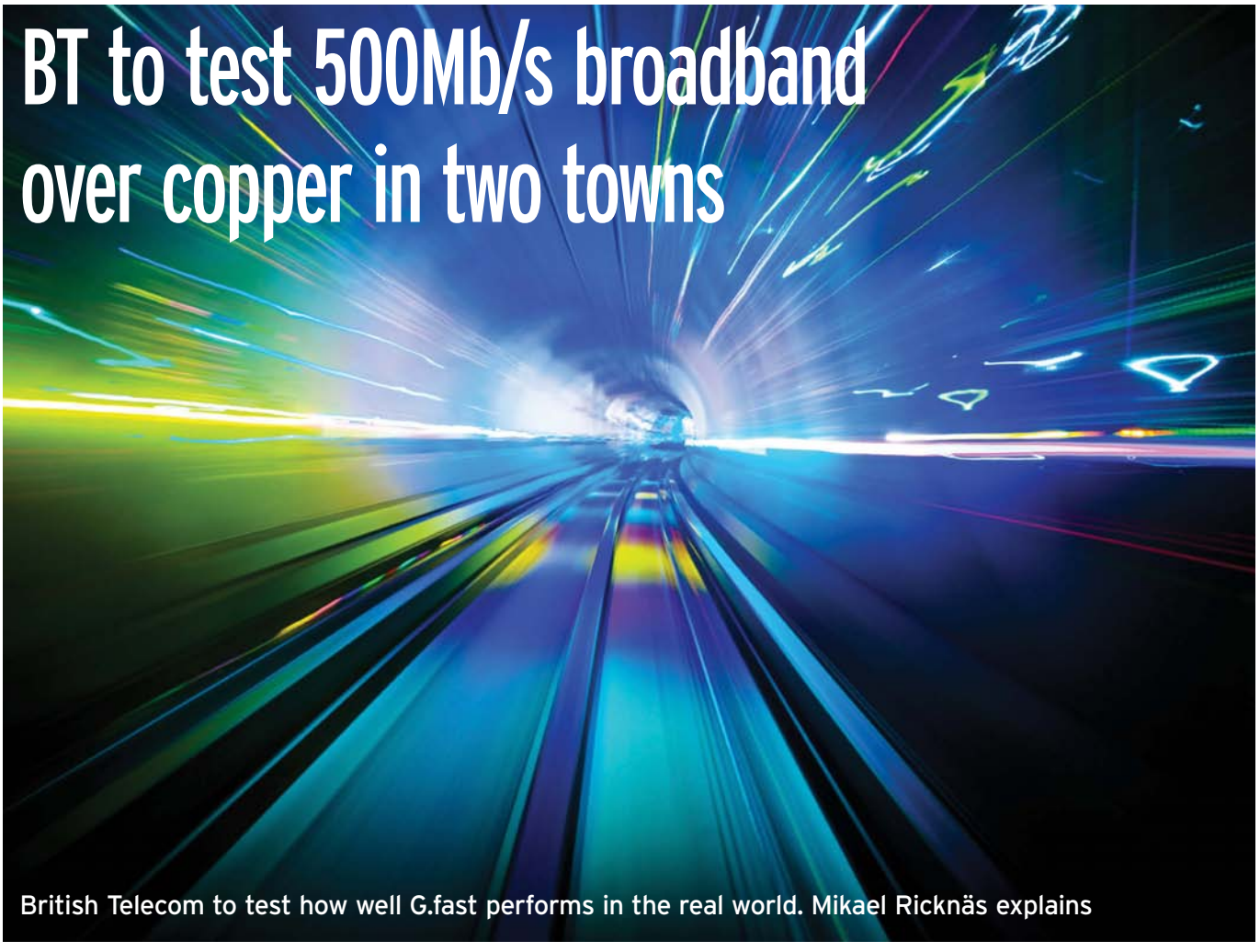
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BT to test 500Mb/s broadband over copper in two towns



British Telecom to test how well G.fast performs in the real world. Mikael Ricknäs explains

British Telecom thinks that a new technology called G.fast can increase broadband speeds over copper to hundreds of megabits per second. The telecoms giant has said it will conduct trials to see whether this is the case.

If these are a success, it's not only good news for homes and businesses that don't have access to fiber in the UK, but also across Europe, as they will likely encourage operators in other countries to bet on the technology, too.

Around 4,000 English homes and businesses will participate in the trials, which aim to find out what speeds can be delivered using G.fast at scale. They will be conducted this summer in Huntingdon, Cambridgeshire, and Gosforth in Newcastle.

What speeds G.fast users will get depends on a number of factors, including the quality of the copper and the distance between the operator's network equipment and the modem. For example, in 2014 BT achieved download speeds of around 700Mb/s and upload speeds at 200Mb/s over a distance of 66m during a small field trial.

BT is more conservative when it comes to real-world speeds, but still expects to offer users a few hundred megabits per second initially. Speeds will then increase to around 500Mb/s for a majority of users, as new standards are agreed on and hardware based on them developed, it said.

The speed increase is needed for applications such as streaming 4K video, IPTV, cloud-based storage, and communication via HD video, according to the ITU (International Telecommunication Union), which has developed the underlying standard. At this year's CES trade show, chipmaker Sckipio Technologies demonstrated G.fast's ability to carry 4K TV.

Last year's trials are the reason for BT's current optimism. They demonstrated that G.fast can deliver big speed increases from existing and new fiber street cabinets, as well as from other points closer to the customer. That's an important development because it means the technology can be deployed faster and more efficiently than previously thought, according to BT.

BT isn't the only European operator that has high hopes for G.fast. In October 2014, Telekom Austria said it had connected the world's first subscriber using the technology.

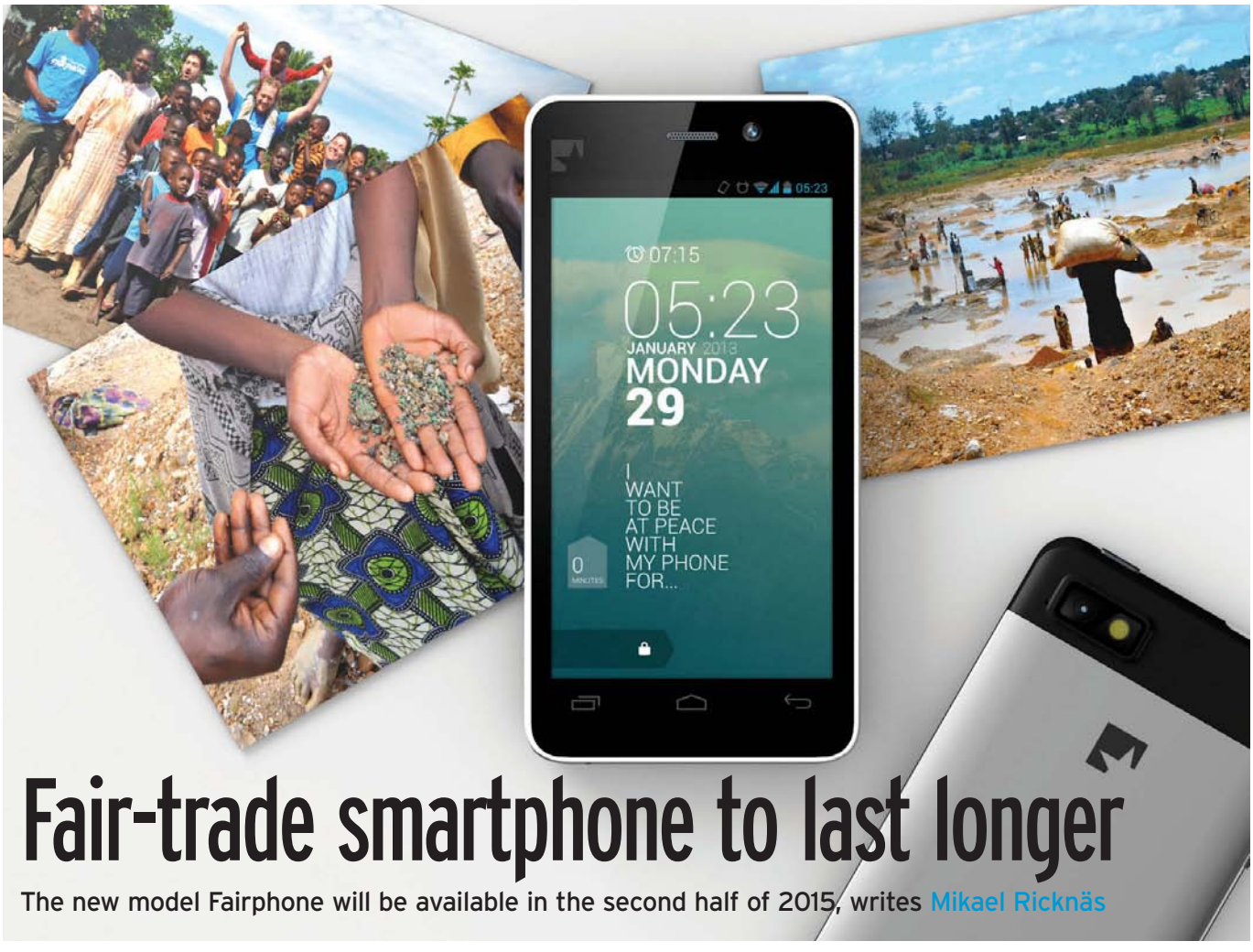
Telekom Austria has apartment buildings in cities in mind for large-scale commercial installations next year. In this case fiber is deployed all the way to the basement of a building, and existing copper lines are used for the final connection to the apartments.

BT plans to offer its first commercial G.fast services in 2016 or 2017, depending on the results of its tests. The ITU expects at least one operator to offer commercial G.fast services before the end of this year.

In the past year, G.fast has made a lot of headway, but it hasn't always been easy going. The technology increases the bandwidth by using more spectrum. That requires hardware to be good at handling interference, a far from trivial requirement.

Getting it to work has been a challenge for chipset manufacturers and equipment vendors. The standardization of G.fast started in 2011, and was meant to be finished by April 2014. That time frame proved overly optimistic for such a complex effort. In the end, another seven months were needed to get it right.

Both BT and Telekom Austria see a future where fiber all the way to homes and offices is used alongside copper networks. BT is also planning to develop a premium fiber broadband service for consumers and businesses that want even faster broadband, up to 1Gb/s.



Fair-trade smartphone to last longer

The new model Fairphone will be available in the second half of 2015, writes Mikael Ricknäs

Photography by Fairphone

Dutch company Fairphone has announced that its second smartphone will not only be built using conflict-free or fair trade minerals, but also offer better performance and be straightforward to repair.

After selling 60,000 units of its first phone (pictured above), Fairphone is now turning its attention to a new model that will go on sale in the latter half of the year. With the second phone, the goal is still to manufacture a device that doesn't use minerals from conflict zones, is recyclable and is made by workers who are treated well.

Fairphone is also aiming to make product longevity a development goal. The longer a device lasts, the less waste it creates and the fewer resources it requires, founder and CEO Bas Van Abel said in a blog post.

Part of that effort will be to develop a higher-end LTE smartphone that remains competitive longer, according to Abel.

The company's first model is powered by quad-core processor from MediaTek and has a 4.5in, 540x960 pixel screen. Beyond adding LTE, Fairphone didn't say what improvements the new model will offer, but a 5in screen and at least 1080x1920 pixels is reasonable to expect. If the company wants to stick with MediaTek, it can choose from two 64-bit octa-core processors.

Fairphone also wants to build a phone that easier to repair. The first model got a 7 out of 10 score in a teardown review on repair website iFixit. Positive attributes included that it's easy to open up the device and access the components. However, the glass is fused to both the display and the display frame, which increases repair costs, so that should be changed on the new model.

In general, today's high-end smartphones are a mixed bag when it comes to ease of repair. Apple has a reputation for building devices that are difficult to fix, but the iPhone 6 and 6 Plus also got a 7 out of 10 score on iFixit. The company still uses proprietary Pentalobe screws, and it doesn't share repair information with independent repair shops or consumers. But the display assembly comes out easily and the battery is also simple to access.

On the other side of the spectrum there are products such as the HTC One M8, which only scored 2 out of 10. The device is very difficult to open up, has a battery that's buried beneath the motherboard, and the display assembly can't be replaced without tunnelling through the entire phone.

Fairphone is hoping to boost sales with improved specifications and repairability. Its goal is to sell about 150,000 phones per year. That's nowhere near as many devices as Apple or Samsung, but because it is a much smaller company it doesn't have to sell a high volume of phones to survive.

Fairphone isn't the only company working to make smartphones last longer. The growing momentum behind modular devices promises to revolutionize how smartphones are built, by letting users design their own phones and upgrade the hardware without having to buy a whole new phone.

Later this year, Google will roll out mobile stores where users can design, print and assemble their own custom handset based on the Ara platform. The Ara architecture uses an endoskeleton, which is the structural frame and data backbone of the device. Users can attach different modules to it, depending on variables such as which processor or camera they want.

Finnish startup Puzzlephone is also working on a modular platform of its own. Turning this vision into a viable business will be a struggle, but if the goal is to build long-lasting smartphones it may be the best option. ☒







Slow Android Wear sales underline challenges Google and its partners face

Mikael Ricknäs sees hardware constraints and lack of good reasons to buy holding back Android wearables

The Android smart watch's time may not yet have come: despite heavy promotion of Android Wear, Google's hardware partners, including Motorola Mobility, Samsung and LG, shipped only 720,000 devices in 2014.

With the arrival of products such as Motorola's Moto 360, the smartwatch market was expected to take off, but data from market research company Canalys shows that consumers are still far from convinced that they need to buy one. "Android Wear will need to improve significantly in the future, and we believe it will do so," explained Daniel Matte, analyst at Canalys.

Those improvements have to happen across the board, including a better user interface and improved battery life, according to Francisco Jeronimo, research director for European mobile devices at IDC. "I use a lot of mobile devices, and found the Android Wear interface difficult to learn. And when I finally had learned how to use it, I really didn't like the experience," he said.

Battery life is also a concern, and one that can't be easily solved. The arrival of customized chipsets will help but that can't change the size of smartwatches, which means you can only use a small battery.

Some vendors are also tripping up both themselves and users with their design choices. For example, users of Samsung's smartwatches need a cradle to fill an empty battery, instead of plugging a charger directly into the device. That just adds an extra level of complexity for users.

However, the biggest obstacle is that Google, vendors and application developers haven't come up with a reason why consumers should invest in an Android Wear smartwatch. With these shortcomings it hasn't been able to dominate the smartwatch market in the way that Google's platform has taken over smartphones.

Rival Pebble shipped a total of one million units from its 2013 launch through to the end of 2014. Continual software updates, more apps in its app store and price cuts in the autumn helped maintain strong sales in the second half of 2014, according to Canalys.

But all eyes are now on Apple and its Watch, which is scheduled to go on sale in April. Jeronimo goes so far as to say the future of smartwatches now rests on Apple's shoulders. "If Apple can't get it right it may kill the category, because if Apple can't succeed which company can."

Apple's CEO Tim Cook seems convinced the Watch can deliver, saying that users will find enough features to not be able to live without one, he said this week. Just as the company changed the markets for MP3 players, smartphones and tablets, Apple's Watch will change the smartwatch market.



PEBBLE WATCH

Microsoft pushes Office on to Android and iOS

Microsoft has stepped up its push to get Office on to all tablets and smartphones, reports Mikael Ricknäs

As we report on page 7, Microsoft has made its Word, Excel and PowerPoint apps for Google's Android OS generally available. It has also released new Outlook apps for Android and Apple's iOS.

All three Office apps are available for download from Google's Play store. The launch is a part of Microsoft's strategy to become more cross-platform friendly across its entire portfolio of apps and services.

That there is an interest was illustrated when the company launched Office apps for Apple's iPads in March 2014. Plus, the preview versions for Android were downloaded 250,000 times, according to Microsoft.

The Android versions of Word, Excel and PowerPoint have inherited the touch-friendly look and feel of the iOS versions. Large touch points make it easy for even the fattest of fingers to navigate commands, Microsoft said in a blog post.

For Microsoft, the apps are step in the right directions as it tries to appease Android users. "While the company is playing catch up to Google in the Android tablet space, it's stepped on the pedal and isn't far behind. It just needs to keep cranking out the features and honing in on making its cloud performance rapid and reliable," Greenbot said in a generally positive hands-on review of the final versions.

All three apps are compatible with Android 4.4, also known as KitKat. They also work on tablets running Android 5.0 or Lollipop, but there will be no official support until Microsoft puts out a software update. The apps also require an ARM processor until Microsoft puts out an update for Intel processors, which will come within a quarter.

For consumers, basic functionality for creating and editing documents is free as long as their tablet isn't bigger than 10.1in, while premium features require an Office 365 subscription. Those who own a tablet with a screen size greater than 10.1in – such as the Samsung Galaxy Tab S, which has a 10.5in screen – need an Office 365 subscription to use the apps.

For commercial use, employees will need an Office 365 subscription for editing as well as premium features.

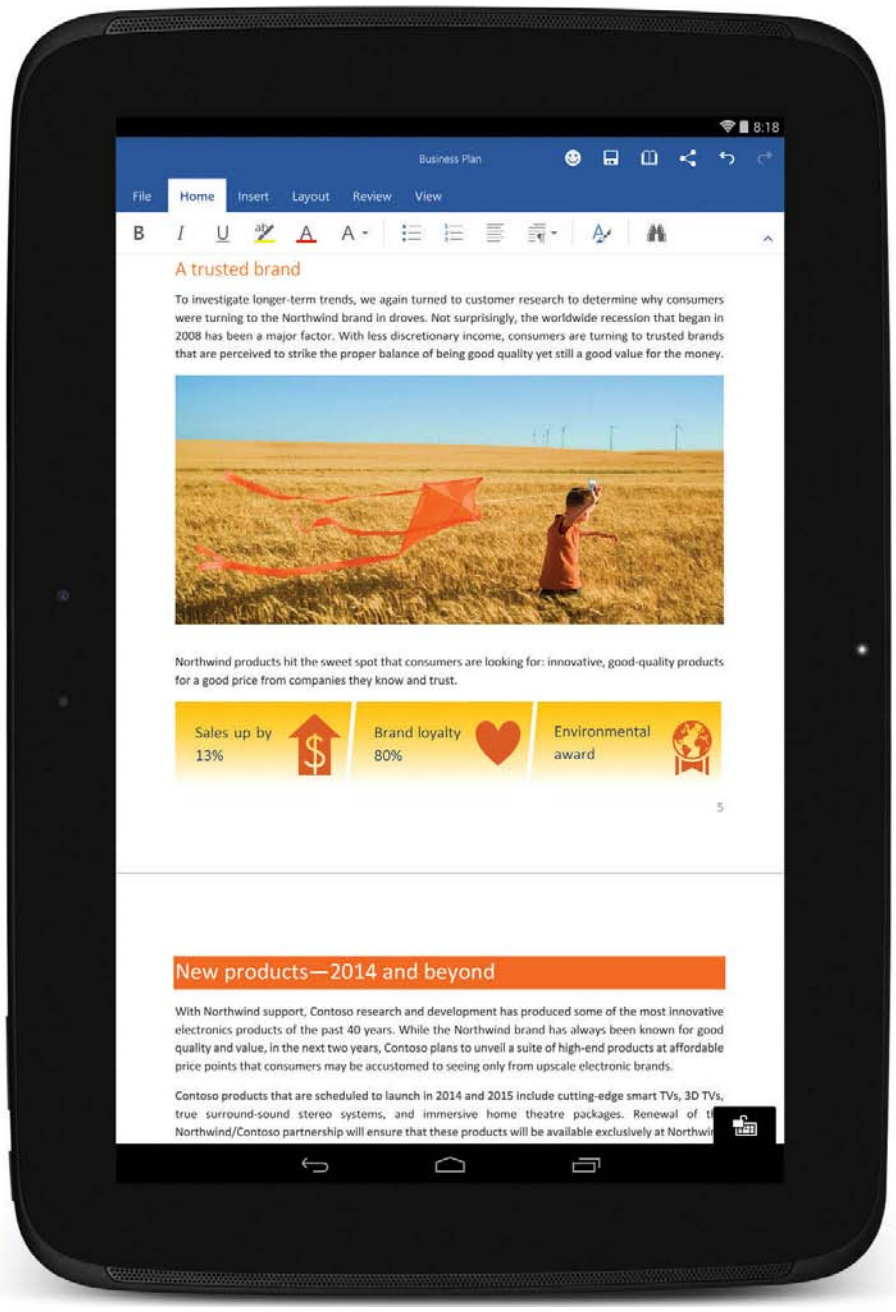
Outlook update

Microsoft also announced the release of Outlook for iOS and a preview of Outlook for Android. The iOS version of Outlook is ahead of the Android edition in terms of features and performance. Once Microsoft has completed sufficient work on Android to close the gap it will remove the Preview label, Microsoft said in a blog post.

The apps offer customizable swipe gestures, allowing users to swipe right or left to take actions like archive, delete, move, flag, mark as read or unread. There is also predictive search and a calendar that's available within the app, according to Microsoft.

The apps separate emails using two tabs – Focused and Other. Important mails are meant to appear in the Focused inbox, while the rest remain accessible under the Other tab. The users interfaces are adaptive to fit better on larger devices like the iPad and Android tablets.

The launch is a result of Microsoft's acquisition of Acompli at the end of 2014, which was sign that the company had finally decided to take Outlook on smartphones and tablets seriously. The apps released on Thursday will replace OWA for iPhones, iPads and Android as well as the Outlook.com Android app.



ARM steals market share

ARM chips are going into more embedded devices, which could hurt PowerPC the most, says Agam Shah



The PowerPC is best-known for powering older Mac computers, while MIPS processors were in the first PlayStation, NASA's New Horizons spacecraft and the first sub-£100 Android tablets. Now, both processor families are widely used in equipment such as networking gear, but are being threatened with the emergence of ARM chips for embedded devices.

The ARM chip architecture is used in most smartphones and tablets, but is making its way into a wide range of appliances and computer equipment used in data centres and offices. More processor makers are expanding their use of ARM in so-called embedded equipment such as storage and networking devices, and even multifunction printers.

MIPS and PowerPC chips were originally designed for workstations and PCs, and have found a stronghold in embedded devices. ARM processors, however, are getting faster, and more developers are writing programs for the architecture. Intel is also trying to expand its presence in the embedded market with its x86 chips, but is not as strong there as its competitors.

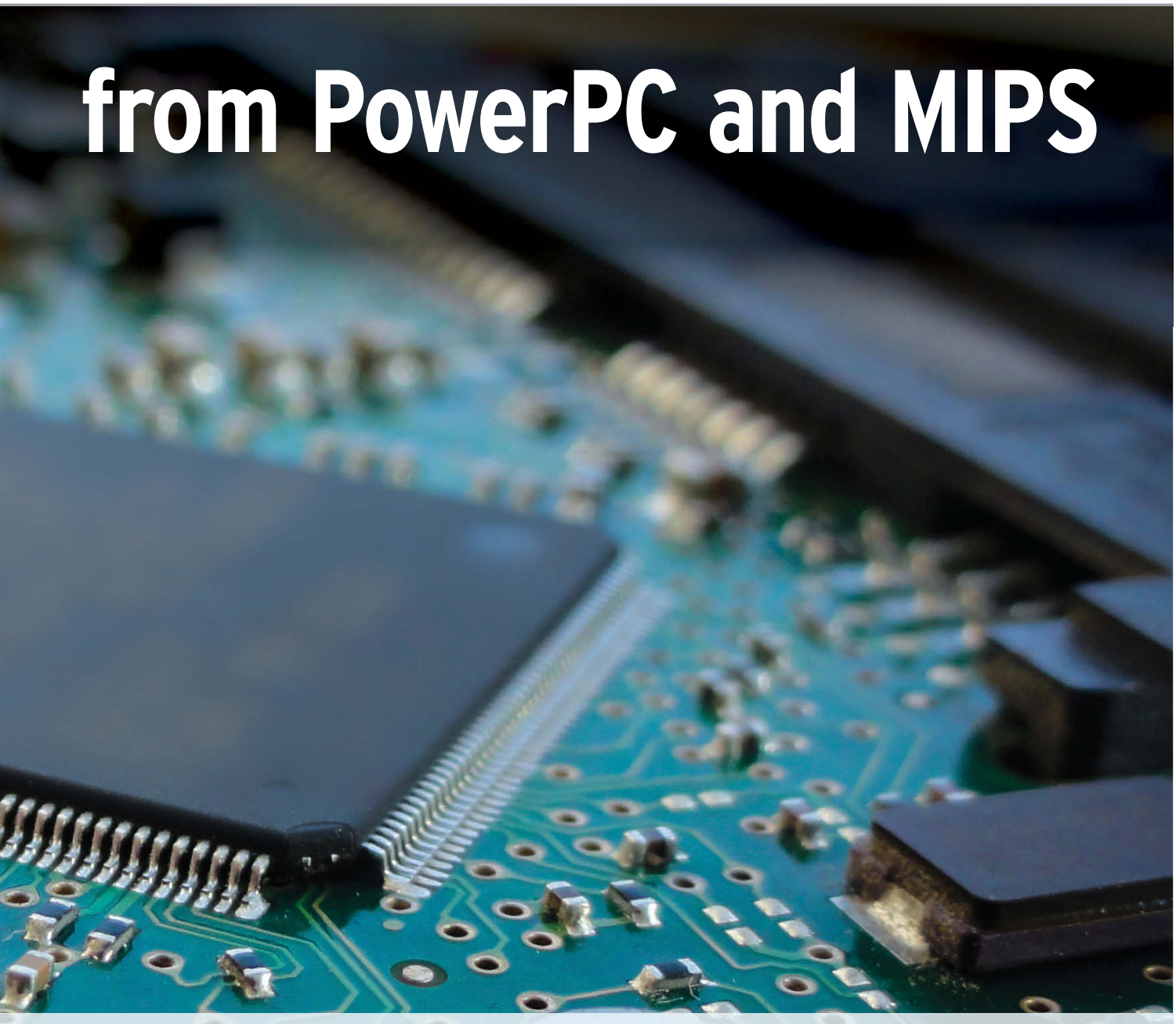
The explosion of mobile devices has helped ARM, increasing awareness of the architecture and swaying more software developers in its direction. The Cambridge-based company is making an impact in the market for embedded devices with the newer 64-bit chips, which can speedily analyse and process data, analysts said.

PowerPC will perhaps suffer the most from ARM's emergence, said David Kanter, an analyst at the Linley Group. "ARM really got to the point where their cores were used by almost everyone – even Intel – whereas PowerPC was always just for a few companies," Kanter said. "IBM's major open-source presence carried PowerPC a long ways, but it simply isn't enough to overcome the resources behind ARM."

MIPS is in better shape and is still backed by legacy installations. Backward compatibility may prompt hardware makers to continue using the processor architecture in newer hardware.

"MIPS never had a major open source backing, so fell behind faster. But because it's a licensable ISA [instruction set architecture] with licensable cores, there was more widespread support historically," Kanter said.

from PowerPC and MIPS



Nevertheless, ARM is enjoying fresh support. For example, AppliedMicro – which offers embedded processors based on MIPS and PowerPC – is now looking to ARM for its newer embedded chips.

"With the vast ecosystem around ARM solutions and a wide variety of performance-to-power optimization points that ARM has to offer, now including the high-end performance of 64-bit ARM cores, there's not much motivation for a system designer to adopt a niche... architecture for new designs," said Chris Bergen, senior director for technology at AppliedMicro, in an email.

AppliedMicro is using ARM in its latest Helix-2 for products that require high performance, low-power consumption and either wired or wireless connectivity. Helix-2 is also designed for use in Internet of Things equipment, where the ability to quickly analyse and transmit data is paramount.

ARM has an early advantage over rival architectures in the IoT market, said Jim McGregor, principal analyst at Tirias Research. "When you think about IoT devices and networking solutions going forward, it's pretty clear that IoT runs on ARM," McGregor said. "That's not to say that MIPS, PowerPC, and even X86 don't have a place. The architectures themselves have advantages in certain applications and will continue to in the future, but they don't have the development of the ecosystem of ARM."

Equipment makers like to standardise on one architecture to reduce hardware development costs, and ARM is receiving a lot of backing, said Dean McCarron, principal analyst at Mercury Research.

Coming from a mobile background, ARM's architecture has been geared for devices that demand power efficiency, McCarron added.

Network equipment makers Cisco and Netgear have thrown their weight behind the ARM architecture.

Cavium and Broadcom, which are heavy MIPS backers, have also started using ARM in embedded chips. Analyst firm Linley Group believes Broadcom's ARM chip shipments will outpace its MIPS chip shipments in the coming years.

But MIPS architecture is still being widely used in wearables, and maintains a large market share in networking equipment and set-top boxes. MIPS Technologies was on the brink of collapsing until it was bought by Imagination Technologies in

>> Continued on page 22

Continued from page 20-21

2012. Imagination is resuscitating MIPS and in the past 12 months has signed more than 48 new licensees for the architecture. The number of devices with MIPS CPUs has reached all-time highs.

So although ARM is making headway outside of the mobile arena, it is not taking over in embedded and other application areas, said Tony-King Smith, executive vice-president of marketing at MIPS.

"MIPS is not only here to stay, it's getting a lot stronger thanks to Imagination more than doubling resources and investing massively in its future," he said. "MIPS delivers superior performance in less silicon area, and will be a key player in the future of IoT and all things embedded where these things make all the difference, already demonstrated in markets such as networking and enterprise where MIPS has major market share."

Smith pointed out that Imagination customers have a wide variety of CPUs, video processors and connectivity options to mix and match on a chip.

Imagination is best known for its PowerVR graphics core. It has also announced new MIPS Series5 Warrior CPUs, and expects the first mobile devices based on its new 64-bit architecture in 2016. MIPS is already compatible with Android, and Oracle is porting Java to MIPS.

On paper, MIPS processors offer the power-efficiency and performance of ARM CPUs. But Mercury Research's McCarron said sometimes one company just does better, as exemplified by the computer processor market, with Intel topping Advanced Micro Devices even though their chips are on equal footing in terms of features.

Lenovo building its first prototype ARM server

Lenovo's NextScale is an effort to build more power-efficient systems for data centres, says Agam Shah

There's a growing interest in developing ARM servers as a power-efficient alternative to systems based on Intel's processors. Lenovo is the latest hardware vendor to test the concept with a prototype system.

It's building the server together with the UK-based Science and Technology Facilities Council. The project aims to see if it's possible to scale up system performance while keeping power draw in check.

Low-power ARM chips are used in most smartphones and tablets, and server makers hope they will bring higher levels of power efficiency to servers as well. Data centre servers, especially those supporting cloud services and applications, are handling increasing processing burdens. Companies such as Facebook and Google that run huge data centres are interested in ARM servers as a route to lower electricity bills.

The Chinese company is the last of the top three server makers to get in on the ARM game. HP already offers ARM processors for its Moonshot dense server, while Dell is still experimenting with the architecture in its servers.

Lenovo is using 64-bit ARM processors in a NextScale system, which was first developed by IBM but then turned over to the Chinese server company as part of the x86 server portfolio sale in 2014. The NextScale rack-scale server – which competes with HP's Moonshot – was originally built in late 2013 around low-power x86 chips, but has been expanded to include a water-cooling system and Intel's Xeon chips.

The goal of the prototype ARM server is to drive up performance-per-pound and performance-per-watt compared to traditional server design methods deployed today, explained Doug Augustine, a Lenovo spokesman.



LENOVO'S NEXTSCALE SYSTEM

The ARM server is optimised for specific uses like web search, caching and cloud, Augustine said.

The NextScale can hold up to 12 ARM-based server boards, or 1152 processing cores. Lenovo is using Cavium's ThunderX system-on-chips, which includes ethernet, memory, I/O and other key interfaces. Each ARM chip has up to 48 cores, and can operate at a frequency of up to 2.5GHz.

Besides Cavium, AppliedMicro, AMD, Broadcom, and others are supplying chips for ARM servers.

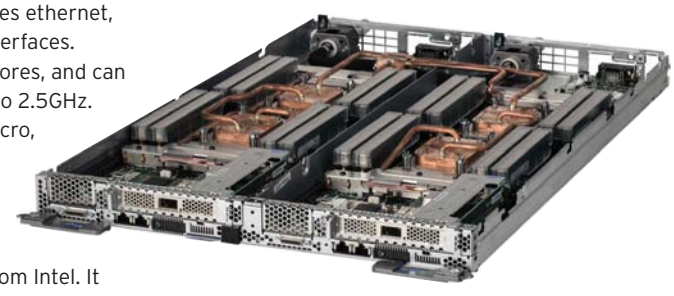
Lenovo today sells only servers with x86 chips from Intel. It doesn't view ARM servers as a high-volume opportunity at the moment, Augustine said.

Intel today holds more than 90 percent market share in servers, and even ARM server chip vendors like AMD have admitted it may take many years before the chips are widely adopted in data centres. But an effort is underway to raise awareness about the chips' benefits and to develop compatible software.

Lenovo's project is a positive sign for ARM, said Jim McGregor, principal analyst at Tirias Research. Qualcomm said late last year that it is developing ARM-based server chips, and momentum behind the architecture is only growing, he said. "It's going to make the server environment more competitive, that's what everyone is waiting for," McGregor added. "It's just a question of how long it's going to take."

The market for ARM in the enterprise will only take off when the ecosystem that rides on it is built, Lenovo's Augustine said. OS, hypervisors, compilers, performance optimizers, file systems, and the like are just starting to be put in place, he said.

Many Linux applications are already compatible with ARM server chips, and Oracle's Java supports the architecture. Microsoft is said to be building a version of Windows Server for ARM processors.



Five things to expect from AMD's Carrizo chips

Carrizo promises big gains in power efficiency and better graphics, according to AMD. Agam Shah picks out the five most important aspects of Carrizo



The PC market has stabilized lately, but that hasn't done much for AMD, whose PC processor shipments are in decline. The company hopes to recover momentum this year with a new laptop chip coming soon code-named Carrizo.

It recently provided technical details about Carrizo at an IEEE chip conference. Here's some of the information we gleaned.

1 Carrizo will launch in the second quarter of 2015, so laptops with the chip should be available soon after that. They'll appear initially in lower-end and mainstream systems, which should get a bit thinner and lighter as a result. AMD didn't announce any prices, but the laptops will likely be a bit cheaper than Intel-based systems with comparable chips.

2 AMD says Carrizo will offer unprecedented gains in power efficiency, in part thanks to fine-grained power management between the chip's CPU and GPU. It has also added technology that can adjust the voltage up or down more efficiently, with less power wasted in the process. The efficiency gains will be most apparent for basic tasks and less so when playing games or watching video. It didn't give specific battery life projections; we'll have to wait for launch time to get those.



3 The chip should provide a significant boost in graphics performance, long one of AMD's strengths. Laptops will comfortably play 4K video, though you'll probably still want a separate graphics card for 4K gaming, which requires a lot more oomph. The integrated GPU in a top-end Carrizo chip will have eight cores that can operate simultaneously, an improvement from six on the current Kaveri generation. On-chip accelerators render 4K video using the H.265 (also called HEVC) format.

4 Gains in CPU performance will be more limited, which means you'll notice less improvement for applications that aren't graphics intensive. Previous new chips have seen instructions per clock cycle increase as much as 30 percent, but the CPU in Carrizo, which is code-named Excavator, will offer improvements in the single digits. AMD says it focused on power efficiency over performance: the CPU core uses 40 percent less power than its predecessor, the vendor says. Carrizo also supports the Heterogeneous System Architecture 1.0 specification, which is supposed to do a better job balancing execution between computing resources.

5 A minor but important detail is Carrizo's support for DirectX 12, which will drive gaming on Windows 10 PCs. AMD wouldn't provide much information about the chip beyond its architectural details, but software drivers are being developed for the new Windows OS. Microsoft uses AMD chips in the Xbox One, so software and hardware gains in that platform could find their way into AMD-powered PCs, said Jim McGregor, principal analyst at Tirias Research.







ZTE Blade S6

Smartphone

No, it's not the iPhone 6s come early. This is ZTE's latest smartphone, which looks similar to its Apple-flavoured rival. Appearances aside, the price tag is low and it's the first phone we've seen with a Qualcomm Snapdragon 615 octa-core processor. Also on the spec sheet are 4G LTE support and a 5in HD screen.

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CHRIS MARTIN



Hannspree Micro PC

PC

Streaming sticks like Google's Chromecast are now a familiar sight but Hannspree has fitted an entire PC inside one. This is a fully functional Windows 8.1 PC that fits in the palm of your hand and will plug into a TV or monitor via HDMI. Inside is an Intel Atom processor, 2GB of RAM and 32GB of storage.

£139 inc VAT

hannspree.eu



Mouse-Box

PC

An HDMI stick is cool but what about a complete PC inside a mouse? The Mouse-Box is exactly that and is equipped with a 1.4GHz quad-core ARM Cortex processor, Micro-HDMI port, Wi-Fi and a 128GB disk. It's currently a prototype.

Price £TBC

mouse-box.com





Denon Envaya Mini

Bluetooth speaker

It might be small but there's a lot going on inside the Envaya Mini. It features NFC for easy pairing, Bluetooth aptX audio and a microphone for speakerphone. Sound is from two 40mm drivers and a passive radiator. It's also water-resistant and offers 10-hour battery life.

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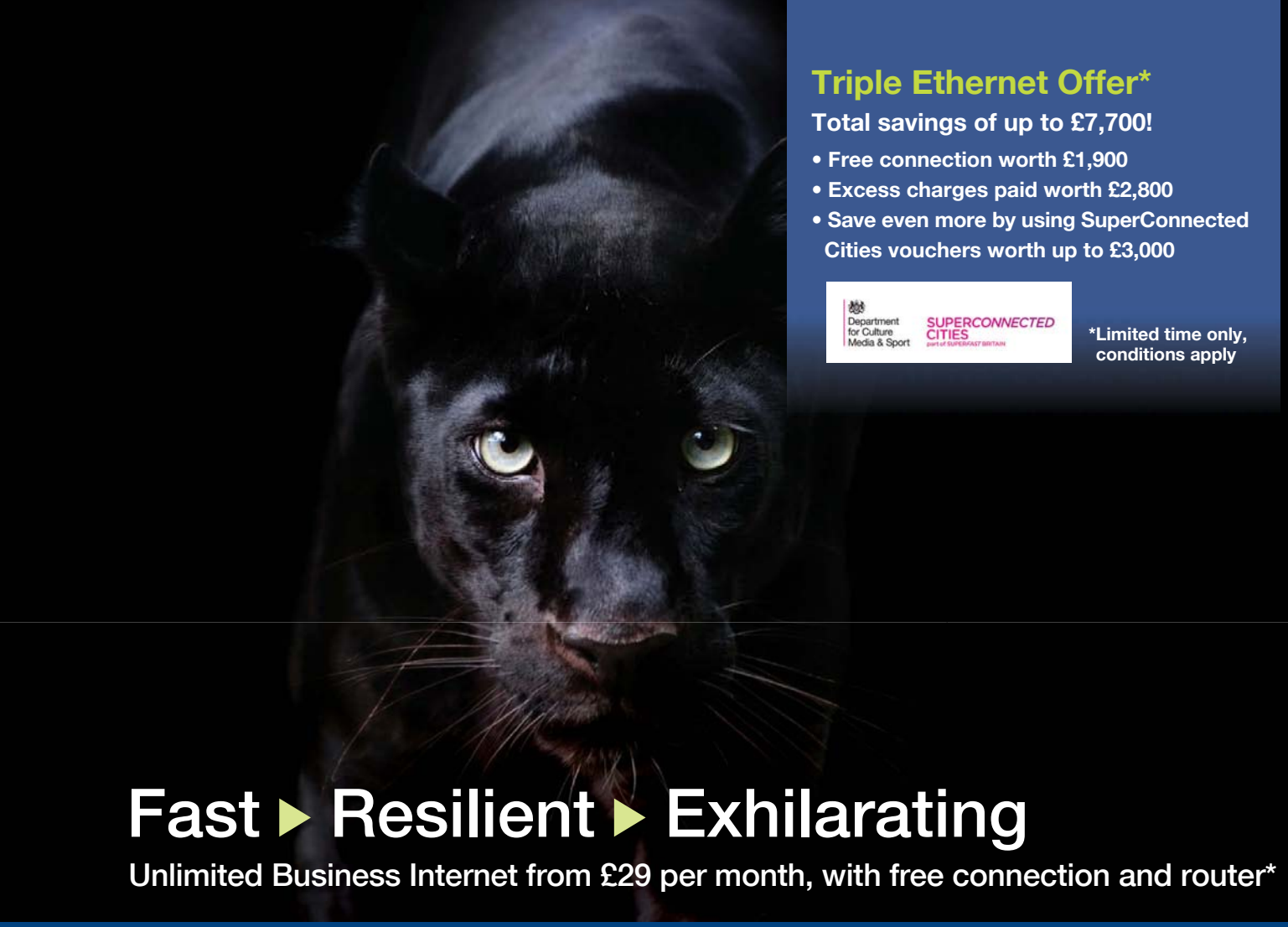
Sony Xperia E4

Smartphone

Competition in the budget smartphone market is hot and Sony hopes to win with the Xperia E4, which costs under £100. The pebble-like phone features a 5in screen, quad-core processor and Android 5.0 Lollipop but lacks 4G support.

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sonymobile.com/gb



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199 euro
steelseries.com





Asus ZenBook UX305

Laptop

Proving that Windows laptops can still be sexy, Asus has added the UX305 to its popular ZenBook range. As well as a sleek wedge-shaped design, it features an Intel Core M processor and a 13.3in touchscreen. It's just 12.3mm thick and weighs 1.2kg.

£649 inc VAT
asus.com/uk



Sonos Blue Note Play:1

Speaker

To celebrate Blue Note Records' 75th anniversary, Sonos has made a special edition of its Play:1 speaker. There are only around 4,000 units available of the limited edition, which features a graded cerulean blue finish created by seven gravity-fed atomising spray nozzles.

£220 inc VAT
sonos.com



New Nintendo 3DS

Handheld games console

Nintendo's new 3DS handheld consoles come in two different sizes. Improvements include face tracking for more comfortable 3D, a C-stick second joystick, NFC for Amiibo and new ZL and ZR buttons.

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nintendo.co.uk



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COMPACT PC

Chillblast Fusion Nano

£1,099 inc VAT

Contact
■ chillblast.com
Read more
■ tinyurl.com/ood3tpw

Specifications
3.5GHz Intel Core i5-4690K Overclocked to 4.3GHz; Asus Z97I-Plus Wi-Fi motherboard; Corsair H55 Liquid CPU Cooler; Gigabyte nVidia GeForce GTX 970 4GB Mini graphics card; Raijintek Metis windowed Mini ITX case (choice of colours); Windows 8.1 64-bit (or Windows 7 Home Premium); 16GB PC3-12800 DDR3 RAM; 250GB Samsung SSD plus 1TB 2.5in Seagate SSHD hybrid drive; 750W Corsair CX750M power supply; 6x USB 3.0; 4x USB 2.0; 1x PS/2 port; onboard HD audio; gigabit ethernet plus Wi-Fi 802.11ac; 190x277x254mm

Build: ★★★★½
Features: ★★★★☆
Performance: ★★★★½
Value: ★★★★★

★★★★½

High-end overclocked gaming PCs generally require substantial cooling systems and employ large, powerful graphics cards to achieve their blistering performance. But, not everyone has the desire to own, or the room for, a large bulky PC.

Enter Chillblast's tiny Fusion Nano: an ultra-compact PC with all the gaming performance you'd expect from a full-sized system.

Built into a heavily modified Raijintek Metis Mini ITX case, the Fusion Nano is one of the best-looking PCs we've seen. It's available in a range of colours including red, green, black, silver and gold.

It has a minimalist design, featuring just a power button on the front and a pair of USB 3.0 ports at the top, complemented by audio in/out jacks.

The right-hand side of the case features a transparent viewing panel, through which you can see, that the internals seem far from cramped, despite the powerful components fitted inside.

This is partly due to the fact that Chillblast has removed the internal 3.5in bay to make space for a Corsair H55 liquid CPU cooler and an nVidia GeForce GTX 970 mini graphics card. The arrangement of the internal components causes the fan on the graphics card, mounted near the top of the case, to blow vertically downward. This wouldn't allow for good airflow into the fan in this particular chassis, so Chillblast has cut a circular hole in the top of the case to allow air to be drawn in from outside. Chillblast tells us that this modification enables the graphics card's fan to run slower and more quietly while maintaining the same required temperature.

This hole has been fitted with a metal guard that will prevent larger items falling through the hole into the fan, although you'll still need to be careful to avoid placing smaller loose items on top of the case. We feel a dust filter would make a good addition here to prevent such mishaps.

When you first boot it up, the Chillblast Fusion Nano's fans spin up to a rather noisily high speed, but after a few moments everything settles down to a pleasantly low sound level.



Considering so much has been crammed inside such a small case, we were impressed by Chillblast's exceptionally tidy internal wiring, made simpler by the use of a 750W Corsair CX750M modular power supply, which allows unnecessary cables to be left out of the case altogether. The least tidy component is the external Wi-Fi 802.11ac antenna, but this can be tucked away out of sight or fixed magnetically to the rear of the case, which is made of steel.

At the heart of the system is an Intel Core i5-4690K Quad Core processor, overclocked to 4.3GHz, teamed up with 16GB of PC3-12800 DDR3 RAM. These are fitted in an Asus Z97I-Plus mini-ITX motherboard which provides an additional four external USB 3.0 ports, four USB 2.0 ports, Audio with DTS support and a PS/2 port for lag-free input.

Fast storage is provided in the form of a 250GB Samsung 850 PRO solid-state drive backed by a 1TB Seagate SSHD hybrid drive.

The one disadvantage of such a small PC is the near total lack of room for internal upgrades. You won't be adding any 3.5in disks or PCI-Express cards, for example – and this is why Chillblast has gone for a 2.5in SSHD in this system.

Performance

Despite its small size, the Fusion Nano turns in some excellent performance results, thanks in part to its overclocked processor. We ran PCMark 7 and achieved an overall score of 6951 points, with an Entertainment score of 6733. Under PCMark 8, we recorded a Home score of 5500 points, which places it well within the performance range of a full-sized PC such as the Chillblast Fusion Dragon (tinyurl.com/pseqggt).

The case size does limit the maximum size of the graphics card, however, but nVidia's GeForce GTX 970 comes in a 'mini' format, which makes it suitable for small PCs like the Fusion Nano, giving it 'full size' performance in a much smaller format. The Fusion Nano flew through our gaming benchmark tests with framerates comfortably within the 100- to 200fps range on high settings at 1920x1080 pixels. Switching to the very highest, or 'Ultra' quality modes also achieved playable results, although Alien vs Predator occasionally dipped below 60fps – to around 55fps during particularly taxing scenes – and the more demanding Sniper Elite V2 required dropping to Medium quality to keep the minimum frame rate above 60fps.

Overall, the Fusion Nano is an extremely fast gaming PC given its compact and convenient size. It's also really quick at just about everything else you may care to throw at it – and highly responsive, thanks to its combination of SSD and Hybrid SSHD storage.

Verdict

The Fusion Nano is a mini marvel, offering superb performance worthy of a considerably larger PC in the form of a compact and undeniably cute gaming system which wouldn't look out of place in any home setting. Internal space is tight, so you can forget about throwing in extra hard drives or add-in cards, but this PC far exceeded our expectations of what's possible from this format. ☒ **Paul Monckton**

GAMING LAPTOP

Aorus X7 Pro



£2,100 inc VAT

Contact
- aorus.com

Read more
- tinyurl.com/kc5w9x8

Specifications
Windows 8.1 (64-bit); Intel Core i3-4012Y 1.5GHz dual-core; 60GB SSD + 500GB hard drive; 4GB LPDDR3 RAM; 11.6in – IPS LED backlight Touchscreen, (1920x1080); Intel HD Graphics 4200; 2Mp webcam; stereo speakers, microphone; 802.11a/b/g/n, Bluetooth 4.0; 3-cell lithium polymer; Micro-HDMI headphone/microphone combo jack, Micro-USB 2.0; full-size USB (keyboard dock); microSDXC card reader; 11mm (tablet) 13.4mm (keyboard); 838g (tablet), 798g (keyboard)

Build: ★★★★☆
Features: ★★★★½
Performance: ★★★★½
Value: ★★★½☆

★★★★☆

Aorus – Gigabyte's brand-new gaming laptop division – has been busy lately. Like much of the Windows PC world, Gigabyte is beholden to its component suppliers to come up with new innovations. And in this case, it has chosen graphics processor supplier nVidia.

The first version of Gigabyte's Aorus X7 laptop used a pair of nVidia GeForce GTX 765M in scalable-link interface (SLI) mode. Then the Aorus X7 V2 (tinyurl.com/kLuxLge) was launched last summer, with two nVidia GeForce 860M processors. And now, to keep up with nVidia's update schedule comes the Aorus X7 Pro, which has also been described as an X7 V3.

In the new X7 Pro, the main change since the X7 v2 is to the graphics processors, although our sample of the X7 Pro also featured a slightly different storage configuration. Instead of three 128GB mSATA SSDs, this model included two 256GB mSATA drives, again arranged in a RAID 0 array.

Such a configuration allows incredibly fast access times – in our tests we saw sequential read speeds up to 781MB/s and writes even faster at 785MB/s. This setup still importantly returned decent numbers for 4kB random reads and writes too, at 27.3- and 78.3MB/s respectively. So here there is a performance hit, ultimately slower than a single non-RAIDed SSD, but still well ahead of HDD performance.

With a queue depth of 32, the results were 443MB/s random 4kB reads and 514MB/s random 4kB writes. The latter result suggests a quick IOPS figure of 132,000 IOPS.

We put the X7 Pro through the usual benchmarks to see how it performed overall. Geekbench informed us of some speedy number crunching; namely 3670 points with a single processor core, and 13,124 points in multi-processor mode with eight virtual cores all running.

In PCMark 7 it earned 6474 points, very close to the 6304 points of the X7 v2. PCMark 8 scores were also beaten, rising from 3983 to 4051 points in the Home test without hardware acceleration. Engaging the dual GPUs brought the score up to 4809 points. In the PCMark 8 Work test, scores rose from 3464 to 4463 points; and then to a mammoth 5144 points with hardware acceleration engaged.

Cinebench scores were impressive. Version 11.5 of the render benchmark reported 1.63 points single-core and 6.52 points multi-core mode; and OpenGL video rendering played at 67fps. Version 15 Cinebench returned 142 and 590 points respectively for single- and multi-mode, while its video clip played at 144fps, the fastest result we've seen.

But running gaming graphics rather than workstation graphics is the reason for which this laptop was built. Where the previous model played Tomb Raider 2013 at 57fps average (1920x1080, High detail) the X7 Pro averaged instead 221fps. Given that incredibly high framerate, we nudged up the quality settings to Ultra (170fps) and finally Ultimate (110fps).

Finally, we put the X7 Pro through its paces with Metro: Last Light. Set again at native resolution and High detail (with all other effects left disabled), it averaged 171fps. And even at uppermost Very High detail setting, and other effects now engaged such as SSAA, 16x AF and PhysX, it still played at a useful 48fps. With some glorious detail and fluidity, it must be said.

On the X7 v2, we found the LCD to be a mixed bag – with wide viewing angles for a budget TN type but an odd vertical grain pattern visible across the entire panel. It looks like the kind of visible lines you'd seen in quality velour paper, only turned 90 degrees. That proved to be the case again for this model, which uses the same Optronics twisted-nematic (TN) display.

In lab tests, it was measured with 95 percent sRGB coverage, and 70 percent Adobe RGB. The reported contrast ratio was better than the nastiest TN screens (80:1), but still only reached 330:1 (where an IPS panel would typically exceed 600:1).

Luminance uniformity was below average, up to around 20- to 30 percent darker across the display's top third, although our eyes are forgiving of even large looking deviations up to this point. Colour accuracy was good overall with an average Delta E value of only 0.97 using a 48-tone test.

The Aorus X7 had disappointing battery life at just one hour, 48 minutes. This sample lasted slightly longer (two hours, 17 minutes) in the same test (streamed HD video over Wi-Fi, 120cd/m^2 display brightness).

Perhaps we should look at that as a good result, considering that both GPUs are active – Optimus graphics-switching technology is not available to SLI-configured systems.

In use, the X7 Pro was annoyingly loud in general use. Cooling fans would spin up and keep switching speed (and hence audible pitch) regularly while the laptop was just idling. And, of course, as soon as a game is loaded the fans are pegged at full volume all the time.

Gigabyte does include a useful software control panel that sits up the Windows Taskbar, from where you can engage Stealth Mode. This usefully reduces fan speed to more comfortable, almost inaudible levels, at 2100rpm. However, this comes at the cost of hampering performance since the processor is running undervolted, and underclocked to 1.6GHz clock speed.

Verdict

With the help of nVidia's recent push to make powerful mobile graphics processors that consume less energy, the Aorus X7 Pro now turns in gaming performance once only available to desktop machines.

☒ **Andrew Harrison**

LAPTOP

Lenovo ThinkPad X1 Carbon

£1,890 inc VAT

Contact
■ lenovo.com/uk
Read more
■ tinyurl.com/pj9fax8

Specifications
14in (2560x1440, 210ppi) semi-matt IPS touchscreen display; Windows 8.1 Pro; 1.5GHz Intel Core i7-4550U (2C/4T), 3GHz Turbo; Intel HD Graphics 5000; 8GB 1600MHz DDR3L soldered RAM; 256GB M.2 SATA SSD; dual-band 802.11ac 2x2 MIMO; Bluetooth 4.0; LTE cellular modem; 2x USB 3.0; Mini DisplayPort, HDMI; 3.5mm headset jack; 1.3Mp webcam; trackpoint and buttonless touchpad; fingerprint reader; 45W mains charger; 45Wh non-removable lithium-polymer battery; 330x225x19.3mm; 1412g

Build: ★★★½☆
Features: ★★★★☆
Performance: ★★★½☆
Value: ★★★½☆
★★★½☆

The ThinkPad X1 Carbon is Lenovo's entry for the ultraportable laptop category. This model has a 14in IPS technology touchscreen display with a resolution of 2560x1440 pixels.

Powering the laptop is a 1.5GHz Intel Core i7-4550U processor, a dual-core design with Hyper Threading Technology, and Turbo up to 3GHz for one core. This also takes care of the ThinkPad's graphics, using the chip's built-in Intel HD Graphics 5000 processor.

For storage, the X1 Carbon has a physically small 256GB Samsung SSD, not mSATA but using the emerging M.2 standard.

For memory, it includes 8GB as standard on the Core i7 models. The 8GB quota will be plenty for most, although if you did require more, you can't upgrade it yourself later.

The chassis has the same layout as the previous generation, with a front that tapers down to a thin edge. The display lid back and chassis top are made from a dark grey composite material. Meanwhile, the base plate is made of a lightweight and thin metal plate.

Unfortunately, this lightweight chassis feels vaguely flimsy, with plenty of flex evident when you hold it by opposing corners and gently twist. There's also more 'give' in the top plate under heavier fingered typing than we find comfortable.

Intel has done well to provide a level of performance from its latest 1.5GHz processor that surpass that measured from a mini PC from 2011 with dual-core 2.5GHz Intel Core i5.

In the Geekbench 3 test of combined CPU and memory speed, single- and multi-core scores were 3075 and 5783 points respectively. That puts the ThinkPad 23 percent faster in single-core mode, and 13 percent faster in multi-core mode, than the reference PC of three years vintage. Not bad for an ultraportable weighing little over 1.4kg.

Graphics performance from the HD Graphics 5000 were found to be satisfactory for some casual light gaming. Using the Batman: Arkham City benchmark test, the ThinkPad could play at one-quarter of its native resolution (1280x720) at greater-than-30 frames per second. To wit, at Low and Medium detail it averaged 35fps (with a minimum at



18fps); and High detail still allowed an average of 32fps. Turned up to 1366x768 pixels, framerates of 32fps were still returned for both Low and Medium details settings.

Lenovo was one of the first Microsoft partners to sell laptop hardware with solid-state drives, and for the X1 Carbon we see a new type of flash drive using M.2 connector. In this case, the storage is still using the Serial ATA bus though, which hinders the technology's potential.

In our measurements of this 256GB SSD, it reached maximum sequential read speeds of 504MB/s, but write speeds of just 257MB/s. Turning to 4kB random IO, the tables turned somewhat as reads were recorded at 26MB/s, while writes fell only to 81MB/s.

Looking at maximum random throughput performance, the SSD hit 99,000 IOPS reads and 64,000 IOPS writes. These input/output per second results are sterling figures that indicate an agile multitask-capable storage solution.

Lenovo has taken the decision to fit a touchscreen. In use we found it suffered the typical usability problems of wobbling display when tapped, and erratic operation thereafter; windows sometimes required several taps to minimise and maximise correctly, for example.

Due to the high 200-percent level of screen magnification, the size of icons and screen furniture made them marginally easier targets to hit with a fingertip than, for example, with a 1920x1080 14i panel running at 100 percent scaling. But here set at 200 percent, the Windows 8 interface also looks even more child-like than is usual with its oversized windows elements – imagine looking at a 14in monitor with a 1280x720 native resolution.

One party trick for the X1 Carbon is being able to open the screen entirely until it lays back flat on the desk. This may be useful for a impromptu meeting, to share what's on screen around a table, although we struggled to find any useful applications beyond that.

Display image quality is mostly good, thanks to IPS technology that here provided wide viewing angles and decent colour reproduction.

However, tested with a Datacolor colorimeter, the ThinkPad's screen was only found to cover 81 percent of the sRGB gamut, and only 60 percent of the Adobe RGB colour space. We would normally expect at least 90 percent sRGB coverage from any high-grade IPS display.

Colour accuracy as measured by 48 spot tones was very good with Delta E average of only 0.84. Contrast ratio was also more in line with a superior IPS panel, peaking at 590:1 at highest brightness settings. Lenovo specifies a maximum brightness at 260cd/m^2, for the touchscreen edition, although in our tests it couldn't exceed 213cd/m^2.

Lenovo says the X1 Carbon has a battery life of nine hours. In our real-world testing, given the light load of playing an MPEG-4 HD video on repeat, streamed over Wi-Fi and with the screen set to 120cd/m^2, it survived just five hours, 45 minutes.

Verdict

There's no denying the portable nature of the X1 Carbon. Ultimately, though, it looks overpriced and more cheaply constructed than alternatives such as the MacBook Air. ☒ **Andrew Harrison**

LAPTOP

HP EliteBook 1040 G1



£2,116 inc VAT

Contact
■ hp.com/uk
Read more
■ tinyurl.com/oz6nr2z

Specifications
14in (1920x1080, 157ppi) IPS matt anti-glare display; 2.1GHz Intel Core i5-4600U, 3.3GHz Turbo (2C/4T); Intel HD Graphics 4400; 8GB 1600MHz DDR3L; 256GB SanDisk X110 SATA Revision 3.0 SSD; gigabit ethernet and VGA via included dongle; 802.11a/b/g/ac dual-band 2x2 MIMO; Bluetooth 4.0; 4G LTE; 2 x USB 3.0; DisplayPort; fingerprint scanner, NFC; microSD, smart card slots; stereo speakers; 0.9Mp webcam; dual microphones; 3.5mm headset jack; 100x68mm buttonless trackpad; 42Wh lithium-polymer, non-removable; 338x232x17.3mm; 1556g

Build: ★★★★½
Features: ★★★★½
Performance: ★★★★☆
Value: ★★★☆☆

★★★★½

The HP EliteBook Folio 1040 G1 is a premium-priced and beautifully constructed ultraportable that stands above almost every other Windows laptop in sheer quality.

It's a 14in lightweight model that's just 17mm thick and weighing little over 1.5kg. It is made almost entirely from real metal. This seems to be anodised to give a dark lustre, more like a gunmetal finish. Only the underside appears to be of plastic, with a slightly soft surface that aids grip. Yet even this is forged from sturdy yet lightweight magnesium alloy, with a thin polymer coat.

Powering this top version of the EliteBook Folio 1040 G1 is an Intel Core i7 running at 2.1GHz, although the laptop can also be found with the more affordable 1.6GHz Intel Core i5 that's the popular fitting in more mainstream ultrabooks.

For memory there's 4GB fixed in place, and an additional SO-DIMM slot that here is filled with another 4GB of DDR3 RAM, to provide 8 GB total. Storage is courtesy of SanDisk, with the flash specialist's X110 SSD used in its next-generation form-factor (NGFF) M.2 format.

What truly separates this laptop from most others is the high calibre of the display, the keyboard and the trackpad. These are the key human interface elements that are rarely promoted from spec sheets, and almost invariably are given very short shrift by less thoughtful manufacturers.

The screen is a 14in 16:9 panel, a common size for business portables, but with full-HD resolution of 1920x1080 pixels. That provides a decent pixel density of 157ppi, and to make the interface more clearly legible HP sets the laptop's Windows 7 Professional operating system with 125 percent scaling.

In our lab tests, this display covered 93 percent of the sRGB colour gamut, and 70 percent Adobe RGB. Contrast ratio, the bugbear of budget LCDs, was at a decent level of 610:1 with the screen at full brightness (295cd/m^2), and still 550:1 at a more usable '75 percent' brightness setting (136cd/m^2).

Colour accuracy was superb, with an indicated Delta E average of just 1.19. And luminance variation was very well controlled, within 4 percent for most of the screen at various settings, rising to a still insignificant 11 percent on the left edge of the screen.

Beyond just the test numbers though, this screen looks superb to the eye. There is a gentle matt anti-glare coating that allows easy viewing near windows or artificial light, and this treatment does not add any perceptible grain.

The keyboard sits slightly rebated into the top deck, and thanks to the laptop's stiff metal construction there is no unwanted flex as you tap away on its short-travel Scrabble tiles. These are backlit if required, with two brightness settings toggleable from the Fn+F11 keys.

Completing the tactile experience is a particularly fine trackpad, which maker Synaptics calls a ForcePad. It closely resembles the large, glass-topped touchpads found in Apple MacBooks, a buttonless design with some barely perceptible movement possible to actuate mechanical clicks from the front left- and right corners. But most of the time a tap-to-click action is all that's required.

The silky trackpad top and its precise, predictable control combine to make a great user experience. The combination of slick surface and Windows 7's glassy Aero interface work particularly well together to give the effect of effortlessly sliding around the desktop interface.

With its 2.1GHz Intel Core i7 dual-core processor, 8GB of memory and 256GB SSD, this laptop ought to be fast enough for any service you'd need of an ultraportable. And in our lab tests, the EliteBook Folio proved amply quick.

Geekbench 3 scored the EliteBook with 3203 and 5962 points respectively for single- and multi-core modes. Cinebench 11.5 indicated point scores of 1.40 and 2.71, while v15 of the same bench test showed results of 128 and 254 points.

Clearly not a laptop for Windows gamers, the HP's Intel HD Graphics 4400 processor is nevertheless capable of some very light gameplay.

In Tomb Raider 2013, we found with quality settings kept down to 1024x768 and Low detail that it could play at 49fps, dropping to a 33fps minimum. At 1920x1080 and Normal it unsurprisingly struggled, averaging just 14fps; but for some reason intermediate resolutions were not available from the game's setup menu, other than a seriously side-cropped 1280x1024 5:4 option.

The SSD is a speedy SanDisk X110 connected to a standard Serial ATA Revision 3 bus, hence capped from its true potential but still capable of sequential reads of 468MB/s, according to CrystalDiskMark 3.

Sequential writes were slower at around 330MB/s, although small-file performance was very good – still at 314MB/s for 512kB files, and 99MB/s for random 4kB writes. Peak performance was found with 4kB random reads at 32 queue depth, where the solid-state drive could manage 84,000 IOPS.

An integral 42Wh lithium-polymer is not especially large for any laptop with Core i7 processor and IPS display, but it proved sufficient for over five hours use.

Verdict

If you must have a laptop built for Windows that can make a statement in build quality and top-class components, check out EliteBook Folio 1040 G1. ☒ **Andrew Harrison**

LAPTOP

Toshiba Chromebook 2



£269 inc VAT

Contact
■ toshiba.co.uk
Read more
■ tinyurl.com/nrmg3vs

Specifications
13.3in 16:9 aspect ratio (1366x768p HD or 1920x1080p Full HD) resolution IPS display; Intel Celeron processor; integrated Intel graphics; 16GB eMMC, plus 100GB free Cloud storage via Google Drive3; 4GB DDR3L (1600MHz) for the Full HD model, 2GB DDR3L (1600MHz) for the HD model; 1x HDMI®-out, 1x USB 2.0, 1x USB 3.0, SD/SDHC slot, headphone/mic combo jack; Wireless LAN (802.11 ac/a/g/n), Bluetooth 4.0, HD webcam with dual microphones; Chrome OS; up to 11.5 hours battery (HD model) or up to 9 hours (Full HD model); 320x214x19.3mm; 1.35kg

Build: ★★★★☆
Features: ★★★★☆
Performance: ★★★★½
Value: ★★★★½

★★★★½

Chromebooks are simple laptops that offer excellent value for money and a surprising amount of productivity, if you're willing to fully embrace the cloud. Up until now, the vast majority of models available have favoured the smaller 11.6in screen size, which is perfect for portability but can be a little cramped if you're working with lots of text or watching videos. Toshiba has addressed the gap in the market with this 13in offering.

Design-wise this laptop bears more than a passing resemblance to its previous iteration (tinyurl.com/q8yjt4v). The chassis is made from silvery-grey plastic with a dimpled pattern on the outer surfaces, and smooth metallic-style finish inside. It's not going to win any design awards, but the device is sturdy, neat, and light at 1.35kg. Various ports adorn the casing including HDMI output, USB 2.0, USB 3.0, and an SD/SDHC card reader.

It's a little curious that the previous model came with two USB 3.0 ports, whereas this has just one, but its hardly a deal-breaker. One useful thing to know is that the solitary USB 3.0 port supports sleep-and-charge, so you can plug in your Android phone and it will charge while the Chromebook is asleep.

Chromebooks keyboards have largely settled on a standard design which is simple and usually spacious. One glaring omission is a caps-lock key, instead replaced with a search key – Chrome is a Google operating system after all. But fear not, if you still wish to shout at people on the internet, then pressing Alt+Search toggles caps-lock mode on and off. The keyboard is very nice, with hardly any noticeable flexing, and the shallow travel of the keys taking about two minutes to get used to.

Complementing this is a generously proportioned touchpad, which is responsive, accurate, and executes the wide range of useful ChromeOS multi-finger gesture controls with no problems at all. It really is a lovely device to work on.

Of course all of this is elevated to another level, in Chromebook terms, by the inclusion of a full HD, IPS display. Yes the HP 11 did feature a lovely panel, but it needed something pretty to look at, as the performance on that model was painfully slow when you had a few tabs open. The Chromebook 2 suffers no such lag, thanks to the Baytrail inspired Intel Celeron CPU, 4GB of RAM, and the resident 16GB SSD storage. Moving between web pages is smart and snappy, plus when you get there everything looks detailed and colourful.

It's enough to bring small tears of joy to the eyes of us who regularly use Chromebooks. The 1920x1080 resolution does make text smaller, but thanks to the simple zoom feature on ChromeOS all the content in the main panel can be set to resize while retaining clarity. We ran mostly on 150 percent and everything still looked very sharp.

One other new feature in the Chromebook 2 is a set of stereo speakers that have been tuned by headphone manufacturer Skullcandy. Searching the casing will reveal no clues to their position though, as Toshiba has placed them under the keyboard. On full blast they expel a boisterous volume that can easily fill a small room. Definition is good, and you can clearly hear the placement of instruments in the mix, but the sound is still devoid of any real bass response due to, well, physics. This is after all a lightweight, thin device. Saying that, the sound is perfectly reasonable for watching videos and streaming music in the background.

Google's Chrome operating system powers all Chromebooks, and keeps on adding refinements that make these devices more and more usable for everyday life. True, you still need access to the internet for a wide variety of tasks, but many apps now work offline, including Google Docs, Gmail, Evernote, Pocket, plus a number of other productivity and entertainment programs. In fact the Chrome store continues to surprise us with its breadth of interesting apps that show how the eco-system is maturing nicely. Things are at their best, though, when Chromebooks are online, and then you have access to an even more extensive library, plus any web-based services.

A few notable exceptions to the rule still apply. iTunes is never going to run on ChromeOS, so if you want to sync your iPhone 6 or iPad Air 2 to a Chromebook well, you're out of luck. Skype is also absent for the most part, it can be used after a bit of hacking but the process isn't for everyone. Thankfully Google's own Hangouts is a decent alternative.

If you want to use Microsoft Office, then it can be done through the free online versions, which are a little feature-bare but sync up through a OneDrive account, so you can edit them in full desktop versions of the suite when you're at work or on a Windows/Mac computer. Google's own office suite is very good too, and as each Chromebook comes with 100GB of storage on Google Drive you won't run out of space anytime soon.

Verdict

If you're happy to live in the cloud for the majority of your tasks, then this is the best way to do it. The device is light, fast, and that screen is worth the money alone. Chromebooks are quickly coming of age, and this model is something that could convert a legion of fans to the ever improving ChromeOS universe. ☒ **Martyn Casserly**

LAPTOP

Asus N550JV

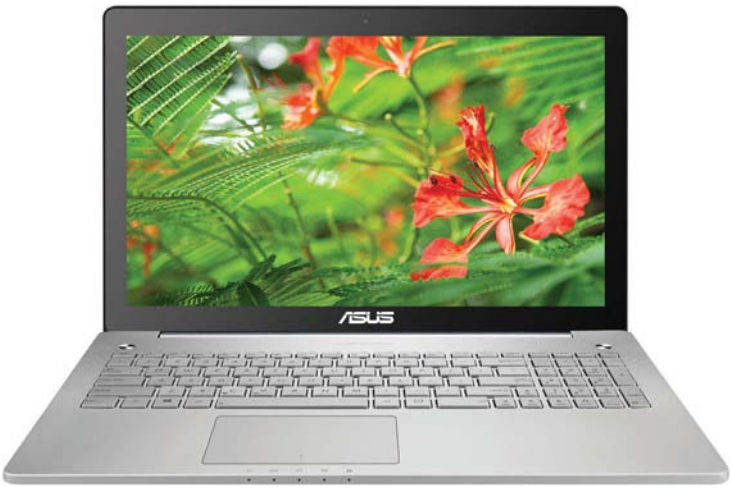
£800 inc VAT

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Specifications
15.6in (1366x768, 100ppi) TN gloss touchscreen display; 2.4GHz Intel Core i7-4700HQ (3.4GHz Turbo) 4C, 8T; nVidia GeForce GTX 850M with 2GB memory, Intel HD Graphics 4600; 8GB (1600MHz) DDR3 RAM; 1TB Seagate 5400rpm HDD; gigabit ethernet; 802.11a/b/g/ac dual-band 2x2 MIMO; Bluetooth 4.0; 3 x USB 3.0; Mini DisplayPort, HDMI; SDXC card slot; stereo speakers; webcam and built-in mic; 3.5mm headphone jack, 105x73mm trackpad; 49Wh lithium-polymer, non-removable battery; 382x256x28.8mm; 2668g

Build: ★★★½☆
Features: ★★★★☆
Performance: ★★★★☆
Value: ★★★½☆



Asus laptops have come a long way since the Eee PC series, which pioneered the netbook category in 2007. Emboldened by that success, Asus subsequently pitched into the mainstream Microsoft mêlée.

The N550JV tries to be a little different though, adding metal to the casework and a dash of European style overall. Specifically, it has more than an air of B&O styling, helped along in no small way by a bold badge under the screen that reads: "Audio by Bang & Olufsen ICEpower."

In most respects the N550JV is an unremarkable 15.6in laptop, running Windows 8.1 and laden with a touchscreen display. This is a low-resolution 1366x768-pixel type, based on budget TN technology, and has a highly reflective gloss finish with no treatment. The combination of large visible pixels and mirror-like finish makes it a poor choice for relaxed viewing and reading.

The chassis is more noteworthy – mostly metal, using a cast aluminium main chassis for the top desk section, and thin alloy plate for the underside. The back of the screen lid is in a darker grey finish but still brushed metal.

Running around the top plate between keyboard and screen are circular ripples of small holes that seem to emanate from two silvery metal buttons. The button to the right is the power key, while its counterpart to the left opens a custom software program for controlling volume, power settings and other user-adjustable settings. This Asus Console provides a full-screen overlay, mimicking the unfortunate look and clashing colours of the Windows 8 Metro interface.

Asus pitches the N550JV as a multimedia laptop, and to that end adds an optical disc drive to play films from DVD. If you prefer Blu-ray playback, there are variations of this model fitted with a BD-ROM or BD-RE drive, although our sample had a Matshita DVD-RAM mechanism.

For those for whom multimedia means games, the good news is that the N550JV is fitted with a decent graphics processor.

The switchable nVidia GeForce GTX 850M with 2GB video memory takes over on graphics-intensive programs, leaving the Intel HD Graphics 4600 inside the CPU for less demanding times. That main processor is a quad-core Intel Core i7-4700HQ, clocked at 2.4GHz and able to short-term Turbo one core up to 3.4GHz.

Supporting the main Intel chip and its integrated graphics is 8GB of 1600MHz memory. The storage side is not so speedy, relying on a 2.5in SATA disk, here of 1TB capacity.

Around the laptop's case are three USB 3.0 ports (two left, one right), Mini DisplayPort and HDMI video outputs and an SDXC card slot. Gigabit ethernet is included, using a compact sprung-door type port.

The keyboard and trackpad are standard fare, the former taking Scrabble tile keys with a good action; the latter large and buttonless but sometimes less precise and sensitive than we prefer.

The combination of Intel Core i7 quad-core and high-spec nVidia GTX GPU keeps the N550JV a fast mover. Geekbench 3 scored the CPU and memory with 3223- and 12,374 points for single- and multi-core performance, both high results.

In Cinebench 15, it was rated with 130- and 642 points for its single-core and multi-core performance, the latter result putting it slightly ahead of an Aorus X7 Pro gaming laptop with its 590-point score.

Overall system benchmarks that can gauge application performance did not rate the Asus so kindly. Held back by its slow storage, it scored just 3150- and 2856 points in PCMark 8's conventional and hardware-accelerated versions of the Home preset.

Delving more into the storage issue, sequential reads and writes from the 5400rpm Seagate disk were just below 100MB/s, while 4kB random reads and writes languished at just 0.36- and 0.75MB/s.

Gaming performance is good. Our low-spec machine tests with Batman: Arkham City at 1280x720 and Medium/High detail were quickly despatched at 85- and 83fps respectively. Set to screen native resolution, albeit not much higher than before, framerates with the same detail averaged 78- and 76fps.

The display is of mediocre quality by the standard of the cheapest laptops available, too low in resolution to render graphics sharply and too reflective to view easily in daylight conditions.

In our lab tests, it could render only 54 percent of the lowest bar of the sRGB colour gamut. Contrast ratio was a low 80:1 in the chequerboard test. And colour accuracy measured poorly, with a high average Delta E value of 8.7.

Powering the N550JV is a non-removable 49Wh lithium-polymer batter. This is charged by a rather large and weighty 120W mains adaptor. In our standard looped-video rundown test the laptop lasted for four hours, 23 minutes, assisted by the Optimus switching system that disables the fast but hungry nVidia GPU.

Despite nailing its colours to the mast of a brand name associated with cool design, the sound quality was little different to that found in most mid-range laptops.

Verdict

The Asus N550JV is a high-performance mid-range laptop, blighted by an abominable touchscreen display and tortoise hard disk. ☒ **Andrew Harrison**

LAPTOP

Lenovo Yoga 3 Pro-1370

£1,000 inc VAT

Contact
- lenovo.com/uk

Read more
- tinyurl.com/nmmwsmy

Specifications
13.3in (3200x1800, 276ppi) IPS gloss touchscreen; Windows 8.1; 1.1GHz Intel Core M-5Y70 (2.6GHz Turbo) 2C, 4T; Intel HD Graphics 5300; 8GB 1600MHz DDR3L; 256GB LiteOn IT L8T-256L9G SSD; 802.11a/b/g/ac dual-band 2x2 MIMO Wi-Fi; Bluetooth 4.0; 2x USB 3.0, 1x USB 2.0/ power charge inlet; Micro-HDMI; SDXC card slot; stereo speakers; 0.9Mp webcam; dual mics; 3.5mm headset jack; tiled, European keyboard; 90x65mm buttonless trackpad; 44Wh lithium-polymer, non-removable battery; 40W USB power adaptor; 330x228x13.5mm; 1184g

Build: ★★★★☆
Features: ★★★★☆
Performance: ★★★☆☆
Value: ★★★☆☆
★★★½☆



If you can't decide whether to buy an overweight tablet or an underpowered laptop, then look no further than the Lenovo Yoga 3 Pro-1370. It folds closed like a regular clamshell notebook, and can be opened up for use as a Windows 8 touchscreen laptop – or, you can keep pushing back the screen until it's revolved 360 degrees, like bending a book right around until its spine cracks. When it's revolved all the way around, hidden magnets help to keep the back of the screen adhere to the back of the keyboard.

Thankfully this hinge didn't crack in our tests. It's a fancy piece of engineering design, based on what looks like an articulated metal watch strap. And at intervals along the hinge are extra bendable links that resemble woven metal cloth.

With the Yoga contorted into tablet mode, you have a 1.2kg Windows 8 tablet and when held as such the exposed keyboard underneath provides an unsettling surface for your fingers with which to support the tablet. The keyboard is deactivated part way on the lid's revolving journey. After satisfying ourselves that this function worked, and given Windows OS poor suitability as a tablet operating system, we continued testing the Yoga 3 Pro as a regular laptop.

Looked upon as a Windows lightweight notebook it makes a lot more sense, and now the 1.2kg weight means it truly is one of the lightest of the breed. Its 13.5mm thickness is no longer that of a bloated tablet PC but a relatively sylph-like notebook.

There are two unusual areas of interest that promote this Lenovo over what may have gone before: its very high resolution IPS display, and the first outing for a new processor type from Intel, from 2014's new Core M series for mobile devices. The low power of the chip is designed for use in tablets without a need for a cooling fan, although Lenovo has fitted a fan to this device which can just be heard spinning.

At 3200x1800, this panel exceeds the pixel count found in the laptops that started the current high-resolution trend, namely the MacBook Pro with Retina display. The 13.3in screen from Apple comprises 2560x1600 pixels, for instance, which results in a density of 220ppi. Here Lenovo is using a Samsung PLS touchscreen with 276ppi; and has set the Windows interface to 250 percent scaling to make the interface actually usable.

In our tests, it could only provide a maximum contrast ratio of 320:1, somewhat reduced from the 800:1 or so we find on high-grade IPS laptop screens. Colour gamut was better than budget laptop screens at 93 percent sRGB, and 68 percent Adobe RGB. And overall colour accuracy was also good for the category at 1.63 Delta E, using the Datacolor 48-tone test.

Intel's new Core M processor was designed to power low-power laptops and similar mobile devices. The Core M-5Y70 is based on the current state-of-the-art 14nm lithography and has a specified total design power (TDP) of just 4.5W. Its clock speed looks underwhelming at just 1.1GHz.

In Geekbench 3, the Yoga 3 Pro averaged 2584 points with a single processor core at work. That effectively places it alongside the reference PC for this benchmark test, a 2010 Mac mini with 2.5GHz Intel Core i5-2520M, which was normalised to score 2500 points.

In multi-core mode, it was less impressive, averaging 4654 points. That's less than twice the single-core speed, and an unusual result; especially for a dual-core processor with Hyper Threading Technology that typically indicates a greater-than two-times multi-core result.

The main CPU clock frequency may be low and its performance somewhat variable, but Intel hasn't scrimped much on the GPU component of this Core M chip. The Intel HD Graphics 5300 graphics engine has 24 'execution units' (EU) which are broadly comparable to stream processors, and a maximum frequency of 850MHz.

In the Batman: Arkham City game test, the Yoga 3 Pro initially indicated an average framerate of 27fps, using our lowest 1280x720-pixel and Medium detail setting. On the second run of the same test, it played at 25fps. Third and subsequent runs saw the framerate drop steadily to 24, 23, 22 then 21, and down to 20. Repeated playthroughs then seemed to stabilise at around 21fps.

Flash storage of the Yoga 3 Pro is courtesy of an M.2 SATA solid-state drive, a LiteOn L9G Series component with 256GB capacity. In our tests this sustained 434MB/s sequential reads and 375MB/s sequential writes, and good 4kB performance of 19.5- and 38.5MB/s random reads and writes. At queue depth 32, this enabled near parity of read/write performance, at 64,000 IOPS.

Long battery runtime is the raison d'être of the new Core M Series processor, and here we found a reasonably good final result. In our standard looped-video rundown test over Wi-Fi, the Yoga 3 Pro lasted five hours, 56 minutes.

Verdict

The Lenovo Yoga 3 Pro is a lightweight ultraportable that can convert into a Windows 8 tablet. Don't be misled by the name, though – it's far from a professional notebook. ☒ **Andrew Harrison**

MICRO PC

Hannspree Micro PC

£139 inc VAT

Contact
■ hannspree.eu/en
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■ tinyurl.com/khpephw

Specifications
Quad-core Intel Atom Processor Z3735F at up to 1.83GHz; 2GB DDR3 RAM; 32GB eMMC on-board storage; Windows 8.1 with Bing; 802.11 b/g/n Wi-Fi; Bluetooth 4.0; 1x Micro-USB, 1x USB 2.0, 1x microSD; 111x38x9.8mm; 38g

Build:
Features:
Performance:
Value:

PCs are cheap as chips these days. As long as you don't need much power, you can buy a tower system (without a monitor) for less than £150. For those who want something considerably smaller, Hannspree has produced what is currently the world's smallest PC, and it isn't much larger than a Google Chromecast (tinyurl.com/qbgtcs2).

The stick PC can almost be described as an HDMI dongle, since it can plug directly into a TV or computer monitor with an HDMI port. It can even take power from a TV's USB port (so long as it can provide 2A, which most can't), though a mains adaptor is included in the box. You also get a short HDMI extension cable in case the display's HDMI port is in an awkward position.

This lets you turn any monitor or TV into an all-in-one PC, with full-blown Windows and the ability to install your favourite applications. You might want to use it to make your TV 'smart' since you'll be able to use a web browser and watch video from YouTube, Vimeo, iPlayer and all other catch-up services.

Around the sides of the glossy black casing you'll find a Micro-USB port for power, a full-size USB port for peripherals, a power button, some vents and a microSD slot. There's no ethernet port, so you'll have to rely on the built-in Wi-Fi for an internet or LAN connection.



Unsurprisingly, there's no Core i5 lurking inside. Instead, the Micro PC has an Intel Atom Z3735F running at up to 1.83GHz, which is respectable given the slim dimensions. It's a 64-bit quad-core chip, which has a base frequency of 1.33GHz.

There's 2GB of RAM and 32GB of flash-based storage. Should you need it, there's also Bluetooth.

Preinstalled is Windows 8.1 with Bing (the free, lightweight version of Windows which occupies less than 4GB of storage). You can't use the device out of the box, though. With only one USB port, you'll need to provide your own USB hub in order to attach a keyboard and a mouse simultaneously. Unless, that is, you happen to have a wireless keyboard and mouse set that requires only one USB port or can connect directly via Bluetooth.

Performance is naturally something of a compromise over a standard PC. In fact, it's best described as smartphone-like. We ran Geekbench 3 and saw results of 767 points in the single-core test and 2107 points for multi-core.

Given that even the iPhone 5s managed 1409 and 2556 respectively, they're not great results. In SunSpider, the Hannspree completed the web test in 550.3ms.

If the Micro PC is appealing because of your all-in-one PC aspirations, just bear in mind that you won't want to run any apps which are too demanding. There's enough grunt for web browsing, emailing, basic photo editing and other similar tasks. What you're not going to be able do is edit video, play 3D games or run any other intensive programs.

A cheaper alternative could be the new Raspberry Pi 2 (tinyurl.com/L65nxbk). It's £30 and has an ARM processor, so while it won't run Windows 7 or 8, it can run Raspbian Linux. And it has four USB ports.



Verdict

The Hannspree Micro PC isn't for everyone. If you want to convert a TV or spare monitor into a Windows PC for watching web videos, emailing, web browsing and other undemanding tasks it will do the job, but the more technically minded might prefer to save money and buy a Raspberry Pi 2 and install Raspbian Linux. ☒ **Jim Martin**

TABLET

Asus Memo Pad 8

£169 inc VAT

Contact
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- tinyurl.com/pmb4Lpa

Specifications
8in LED Backlight WXGA (1280x800) screen; Android 4.4 KitKat; IPS Intel Atom Z3745; quad-core 1.33GHz; 16GB RAM; Wi-Fi; Bluetooth 4.0; 2Mp front camera (720p video recording); 5Mp rear camera (1080p video recording); Micro-USB; microSD card; 124.9x211.7x8.3mm; 322g

Build:
Features:
Performance:
Value:



We thought highly of Asus's Memo Pad 7 (tinyurl.com/odLvok5), awarding it a Recommended award in our review of the tablet, so we couldn't wait to get our hands on its successor – the Memo Pad 8.

Design

The device is available in a variety of colours that are more subdued than the Memo Pad 7's yellow, blue and red, and therefore more stylish. You can choose between a deep purple, a subtle gold and black or white (see right). Our review unit is white, with a soft matt finish that looks great, though, it picks up fingerprints and smudges easily.

Overall, though, it's well-built and sturdy, and doesn't creak under pressure like some of the cheaper tablets we've tried. It's reasonably thin at 8.3mm (slightly thinner than the Tesco Hudl 2's 9mm, tinyurl.com/pgoagrx), and weighs a light 321g compared with the Hudl's 401g, so is comfortable to hold. The ports, buttons, speakers and camera are neat and stylish, too.

It has satisfyingly thin bezels around the display, and a silver band around the edge paired with a silver Asus logo to add a slightly more premium look.

Display

That 8in IPS display has a 1280x800 pixel resolution screen, which is the same resolution as this model's predecessor; though because the Memo Pad 8 has a larger screen, the pixel density is lower at 188ppi. It's not difficult to spot individual pixels on this display, even from a normal viewing distance, and particularly if you've been using a higher resolution display like the one found on the iPad mini 3 (tinyurl.com/Laj5o52), which offers 326ppi.

It's bright, though, and the colours seem bold and vibrant.

Performance

Inside is an impressive 64-bit 1.33GHz Intel Atom Quad-core processor, paired with 1GB RAM.

During our testing, we found the Memo Pad 8 to be responsive and smooth to use, handling most of the tasks we threw at it with ease. At times, however, it was rather slow. For example, when waking up the device, pressing the sleep/wake button didn't cause the screen to turn on immediately, which often resulted in us pressing the button again in our impatience and therefore putting it back to sleep.

In our benchmark tests, the Memo Pad 8 scored 771 and 2436 in the single- and multi-core Geekbench 3 processor test, which is less than the more premium Samsung Galaxy Tab S 8.4's (tinyurl.com/kL6g9fj) 2765, but more than the Tesco Hudl 2's 2165 in the multi-core test.

As for graphics, the Memo Pad 8 scored 16fps in the Manhattan GFXBench test and 30fps in the T-Rex test, which is a smidgen better than the Tesco Hudl 2. The SunSpider JavaScript browser test resulted in a score of 595ms, which is reasonable.

Asus's tablet comes with 16GB internal memory, but you can add an additional 64GB should you need it thanks to the microSD card slot.

When it comes to connectivity, the Asus Memo Pad 8 has Bluetooth 4.0 and Wi-Fi (but not 11ac), but lacks NFC and 3G/4G connectivity.

Cameras

If you plan on using this device for taking photos, you'll be disappointed by its camera offerings. They're not terrible, but we found the rear-facing 5Mp camera to be grainy in darker conditions.

What is good about the Memo Pad 8's camera, though, is the Asus-built camera app, which is always a selling-point for the company's tablets and smartphones. It includes filters, effects, a burst mode setting, HDR, Panorama, a selfie setting, and a smart remove mode that automatically removes moving objects from the image.

The Memo Pad 8 can capture 1080p video, too, and the results are reasonable but far from outstanding. On the front is a 2Mp camera with 720p video recording capabilities.

Software

The Memo Pad 8 runs Android 4.4 KitKat, with an Android 5.0 Lollipop update in the works. That's overlaid with Asus's ZenUI interface.

It offers flat, simple and easy-to-understand icons and apps across the board. This helps make the ZenUI intuitive and quick to master despite being different from the vanilla Android.

Notably, the What's Next feature is a good way of managing your schedule, bringing together events, meetings, birthdays and more from different apps. It'll also provide you with reminders if you've got an appointment coming up, for example.

Verdict

Asus's Memo Pad 8 tablet is stylish, well-built and powerful enough for most users looking to play casual games, browse the web and carry out basic productivity tasks. It is well-worth considering if display and camera quality aren't top of your priority list. **Ashleigh Allsopp**

SMARTPHONE

YotaPhone 2

£555 inc VAT

Contact
■ yotaphone.com/gb-en
Read more
■ tinyurl.com/Lkxx7gm

Specifications
Android 4.4 KitKat OS; 5in AMOLED display (1080x1920, 442ppi); 4.7in rear e-ink screen (540x960, 235ppi); 2.3GHz Quad-Core Qualcomm Snapdragon 801 CPU; Adreno 330 GPU; 2GB RAM; 32GB internal storage; 8Mp rear camera, AF with LED Flash; 2Mp front camera; Video recording at up to 1080p; dual-band Wi-Fi 802.11a/b/g/n/ac; Bluetooth 4.0; NFC; A-GPS; Micro-USB (SlimPort); 4G LTE (Cat 4); nano-SIM; 2500mAh battery; wireless charging; 69x145x8.9mm; 145g

Build: ★★★★☆
Features: ★★★★☆
Performance: ★★★★☆
Value: ★★★½☆
★★★★☆

The original YotaPhone caused a stir with its radical dual-screen design. Well the Russian firm is back with a second-generation smartphone which improves on the original.

The YotaPhone 2 is on sale now and will fetch a high-end £555 – the original is still available at £319. That's a lot to pay, but this phone does have two screens.

If you've seen the first-generation smartphone, you'll probably agree that it doesn't look like a finished product. However, the YotaPhone 2 looks and feels great. From the front, it could be one of many black smartphones, but flip it over and there's no mistaking it from every other handset.

The rear e-ink screen covered by 3D curved matt finish Gorilla glass is stunning giving a premium and unique sense. Not only does it provided needed grip, it also avoids getting grubby with fingerprints and the like – important considering it acts as the rear cover when you're using the front screen.

Overall, the design is simplistic. We like the stealthy, minimalist appearance and the clever way the nano-SIM card slot also doubles up as the volume button rocker.

The YotaPhone concept is simple. On the front is a flagship grade 5in AMOLED screen with a Full HD resolution. Flip the device over and you'll find the 4.7in qHD (540x960) e-ink screen with a still respectable qHD resolution.

That second screen isn't just for reading your ebooks. It can give you notifications, messages and other important information. In fact, you can do anything you want on the rear screen but it isn't suitable for everything. You can unlock it with a careful upwards swipe, though, it's easier to use the physical power button on the side.

Via the YotaHub, you can manage how you use the rear screen. It's split into the Yota Cover and Yota Panel. The first is like a lockscreen and displays whatever wallpaper you want – Yota has loads of gorgeous images to choose from – and has four icons for things phone, messages, email and notifications.

The Yota Cover will be displayed on the back all the time, but if you launch the Yota Panel there's a



lot more you can do. It's essential a set of homescreen panels and you use it just like your regular Android interface. There's a default arrangement, but you can fully customise things with different layouts and a large number of widgets including calendars, clocks, weather, music playback control, RSS feeds, and more.

Once you've discovered your perfect setup, you'll find much less use for the main AMOLED screen and that results in longer battery life which is one of the most complained about downsides to a modern smartphone. Since the e-ink screen is always on, but only consumes energy when the image changes, the phone can last much longer.

When the battery does get low, you can charge the YotaPhone 2 easily because it has wireless charging built-in. Other wireless specs include 11ac Wi-Fi, Bluetooth 4.0, GPS, NFC and support for 4G LTE networks. The second screen is, of course, the main feature here, so don't expect anything like a fingerprint scanner, IR blaster or heart rate monitor.

When we first saw the YotaPhone 2 it had a Qualcomm Snapdragon 800 quad-core processor but it now ships with the newer 2.3GHz Snapdragon 801 chip. It' also has 2GB of RAM and we found performance to be decent.

On the storage front there is 32GB of built-in space. That's double what a lot of phones offer as standard. However, that's the only option available and Yota hasn't included a microSD card slot.

Although the back of the phone has its own screen, Yota has included an 8Mp camera with an LED flash. On the front is a 2Mp webcam that provides a good picture for selfies and video chat. The rear camera takes decent photos and with the stock Android camera app supports HDR.

Yota has opted for Android 4.4 Kitkat for the YotaPhone 2 and has left things completely vanilla which is a great move if you ask us. In essence, the firm thinks Google has done a great job with the operating system so doesn't feel the need to change or add anything.

Verdict

There are a lot of things to like about the YotaPhone 2. The design is excellent and if you want a dual-screen smartphone this is the one for you. ☒ **Chris Martin**

SMARTPHONE

Microsoft Lumia 535

£99 inc VAT

Contact
- microsoft.com/en-gb

Read more
- tinyurl.com/L7ggny2

Specifications
5in (960x540, 220ppi) IPS capacitive touchscreen; microSD, up to 128GB; 8GB storage; 1GB RAM; Wi-Fi 802.11 b/g/n; Bluetooth 4.0; Micro-USB v2.0; 5Mp front- and rear cameras; Microsoft Windows Phone 8.1 with Lumia Denim; Qualcomm Snapdragon 200 (1.2GHz); lithium-ion 7Wh/ 905mAh battery (BL-L4A); 140x73x8.8mm; 146g

Build: ★★★½☆
Features: ★★★½☆
Performance: ★★½☆☆
Value: ★★★½☆



The Lumia 535 isn't the cheapest in the Lumia Windows Phone range: that honour goes to the Lumia 430. And at £100, the 535 has plenty of competition from budget Android smartphones, though, it also offers a lot more than its predecessor, the Lumia 530 (tinyurl.com/oaxpfks).

Superficially, the 535 looks like the 530, but it's a much more grown-up smartphone. The screen has increased from 4- to 5in and it has also slimmed down to under 9mm thick. The 535 measures 140x73x8.8mm and weighs 146g.

The screen has a resolution of 960x540, which is poor in 2015, but at least it's an IPS display. It equates to a just-acceptable pixel density of 220ppi, and it's covered in Gorilla Glass 3.

If this is your first smartphone, you probably won't mind the limited viewing angles and lacklustre colours (and contrast) too much. Part of the problem is that the LCD panel isn't laminated to the cover glass, so it looks as if it's sunken inside the phone. Overall it isn't a patch on alternatives, such as the second-generation Moto G's (tinyurl.com/kcb7c5n) screen, but it's just about usable outdoors.

One of our biggest issues is with the touchscreen. Microsoft has already issued a software update to fix the worst of the problems, but we found the slightest accidental touch by your palm or even using your finger at the slightly wrong angle meant either an errant swipe or an unrecognised tap respectively. When typing, we frequently saw characters doubled up and only by deliberately slowing down could we get it to work properly.

The 535 is unmistakably a Lumia Windows phone, especially if you opt for the bright green or orange versions. However, since the rear covers pop off, you can swap them around at will (there are black and white covers if you want to be more discrete).

We found the super-glossy green version slippery to handle and almost dropped it more than once while trying to take photos. The good news is that there are front- and rear-facing cameras and the back camera has an LED (which is particularly handy as a torch).

There's a headphone jack at the top and a Micro-USB port at the bottom. On the right are the usual power and volume rocker buttons, but no shutter button for the camera.

One of the sacrifices you'll make by choosing a Lumia 535 is the processor. It may be a quad-core CPU, but it's an old Snapdragon 200 running at 1.2GHz. It's backed by 1GB of RAM, which gives the 535 a better chance of being upgradeable to Windows 10: phones with 512MB of memory probably won't be able to run it.

We saw a result of 1295ms in SunSpider 1.0.2, which shows this is no speed demon, and in general use the 535 is a little sluggish and lacks the immediate response you expect from a modern smartphone.

There's 8GB of storage (with slightly over 4GB available for use out of the box), but you can insert a microSD card to expand the capacity by up to 128GB.

The phone also has 802.11n Wi-Fi, Bluetooth 4 and GPS, plus ambient light and proximity sensors. There's no support for 4G, just 3G.

One of the better features is the front-facing wide-angle camera. It has the same 5Mp resolution as the rear camera, making it technically better than even the iPhone 6 Plus.

The bad news is that photos aren't great even in brightly lit rooms: they're grainy and a little fuzzy. On occasion, we also saw painful shutter lag which meant photos weren't actually taken until a second or two after tapping the screen. That meant plenty of blurry snaps as we'd moved the phone thinking the photo was taken.

Oddly, though, video is shot at 848x480 so video clips are very poor. As well as lacking detail, they're also wobbly since there's no stabilisation. They're just about usable as part of a Facebook feed, just so long as no-one tries to watch them full-screen on a PC.

Windows Phone 8.1 has many strengths and is a great mobile OS. As well as Cortana – your digital assistant – you get Here Drive+ (a great satnav app that can work offline) and free online storage via OneDrive. Skype is built in as is Microsoft Office.

The problem is that you won't necessarily find all your favourite apps in the Windows store. The selection is better than it was but there are still gaping holes.

Verdict

When spending £100 there are inevitably some compromises. With the Lumia 535, however, they're seemingly everywhere: screen resolution and quality, video resolution, performance – the list goes on. There are better budget phones out there. ☒ **Jim Martin**

SMARTPHONE

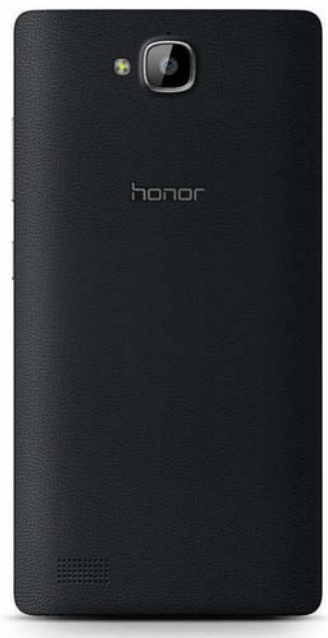
Huawei Honor 3C

£109 inc VAT

Contact
■ huaweidevice.co.uk
Read more
■ tinyurl.com/pqasgb2

Specifications
Android 4.2.2 Jelly Bean OS; 5in (720x1280, 294ppi) IPS display; 1.3GHz quad-core Cortex A-7 processor; Mali-400 MP2; 2GB RAM; 8GB internal storage; microSD up to 32GB; 8Mp rear camera, with LED Flash; 5Mp front camera; Wi-Fi 802.11 b/g/n; Bluetooth 4.0; GPS; A-GPS; Micro-USB; 2300mAh battery; 71.4x139.5x9.2mm; 140g

Build:
Features:
Performance:
Value:





At first glance, the Huawei Honor 3C is a simple but stylish device, with satisfyingly thin bezels and an overall thin and light feel. However, upon closer inspection you'll notice a couple of tell-tale signs that give away its low price tag.

First, the removable plastic back has a tacky shine to it, and it doesn't perfectly align with the camera (at least not on our review unit). Plus, where the glass display meets the plastic rim around the front portion of the smartphone, there's a tiny gap that captures dirt and clings to it for dear life, so keeping it clean is a challenge.

That said, the buttons are neat, the front looks sleek, though, we wish that the touch-sensitive navigation buttons along the bottom were backlit. Huawei's handset is available in black or white.

The Honor 3C's display is one of this phone's biggest selling points. It's a 5in screen with a resolution of 1280x720, giving it a pixel density of 294ppi. That's not the best around – far from it, in fact – but at just £109, it's an impressive addition to this budget handset.

The Honor 3C's processor is an ARM 1.3GHz quad-core chip paired with 2GB of RAM. The table below gives you an idea of how it compares with similarly priced rivals.

It scored well in the Geekbench 3 test, so is among the more powerful of the budget smartphones, but scores very poorly in our graphics test. In the SunSpider JavaScript test (where lower is better), the Honor 3C scored extremely poorly compared with rivals. Huawei's handset recorded a disappointing 2269ms, whereas the Lumia 630 scored 1486ms, while the ZTE Blade L2 recorded 1316ms.

There's just 8GB of internal storage, and the microSD card slot allows you to add only an extra 32GB, though that should be enough for most.

As mentioned at the start of this review, the Honor 3C has a removable back cover, so you can install a new battery should the supplied offering develop a fault. It also allows access to the dual SIM-card slots and the microSD slot.

We found that the battery could last for two or three days depending on how heavily you use it – we were suitably impressed.

As for connectivity, the Honor 3C offers Bluetooth 4.0, GPS and Wi-Fi, though, there's no 4G or NFC capabilities.

It's worth noting that during our tests we noticed a distinct lack in voice quality while making phone calls, which is a big downfall if you intend to make lots of calls, particularly if they're for business or other important purposes.

On paper, the Honor 3C's cameras look good, but in practice we were distinctly unimpressed. The rear-facing camera is 8Mp but lacks focus and speed, so is not ideal for moving objects or for those who struggle to keep a steady hand. It also has problems in low light. There is an LED flash, plus it's capable of 1080p video.

The front-facing camera is 5Mp, so is better than many rivals. There's even a beauty mode that hints that the Honor 3C is the latest smartphone to implement features that help improve selfies.

Another of the Honor 3C's downfalls is its operating system – it's stuck on Android 4.2 Jelly Bean. Alternative budget devices such as the Motorola Moto E (tinyurl.com/moj7L7e) offer Android 4.4 KitKat. Google's mobile OS has been overlaid with Huawei's Emotion UI 2.0 interface, which includes various fun themes to choose from and apps including the Phone Management app that aims to help you maximise power, memory and battery life.

Verdict

The Huawei Honor 3C boasts a sleek design and good screen for the price tag. However, its camera and call quality are disappointing. It's worth considering if you are on a budget, but it's worth looking at similarly-priced alternatives.

Ashleigh Allsopp

	GEEKBENCH 3 (MULTI-CORE)	GFXBENCH (T-REX)	SUNSPIDER
Huawei Honor 3C	1201	6.6fps	2269ms
Motorola Moto E	608	11fps	1877ms
Asus ZenFone 4	805	16.5fps	1363ms
ZTE Blade L2	1191	9fps	1316ms
Nokia Lumia 630	N/A	N/A	1486ms

SMARTPHONE

Samsung Galaxy Alpha

£429 inc VAT

Contact
- samsung.com/uk

Read more
- tinyurl.com/oyv72vm

Specifications
4.7in HD (1280x720, 312ppi) Super AMOLED display; Android 4.4.4 KitKat; Samsung Exynos 5430 octa-core (1.8GHz Cortex-A15 quad + 1.3GHz Cortex-A7 quad) processor; 2GB RAM; 32GB storage); 4G LTE Cat 6; 802.11 a/b/g/n/ac Wi-Fi with 2x2 MIMO and Download Booster; Bluetooth 4.0; NFC; GPS; USB 2.0 12Mp rear camera, supports 4K UHD video at 30fps; 2.1Mp front camera; fingerprint scanner; heart-rate monitor; 1860mAh battery with Ultra Power Saving mode; 132.4x65.5x6.7mm; 114g

Build: ★★★★½
Features: ★★★★☆
Performance: ★★★★½
Value: ★★★★½

★★★★½

Android is more than a match for iOS these days, and Samsung is one of its biggest players. Its compact Galaxy Alpha presents the perfect compromise for those torn between iPhone and Android. It even uses a nano-SIM, easing that transition.

With a sleek metal chassis and shiny bevelled edge that finally tackles a long history of plastic-build-quality criticism, the Galaxy Alpha follows an iPhone-esque premium design. This is the best-looking Samsung phone we've seen.

Samsung's giveaway plastic cover is still found at the rear, but that's not a bad thing when you consider that this makes it less fragile, plus it allows you to access the Galaxy Alpha's battery and swap in a spare.

Despite a larger iPhone 6-matching 4.7in screen (tinyurl.com/Lnkvjkk) over the iPhone 5s' 4in panel (tinyurl.com/mz8jhLf), there's very little difference in these phones' size and weight. The Samsung Galaxy Alpha is sized right in the middle of 5s and 6, a little bigger than the 5s, but only 3g heavier and admirably thinner. In the hand it feels good, and it's perfectly proportioned for one-handed use.

Both have HD screens, with the 326ppi iPhone boasting a pixel density only slightly higher than the Samsung's 312ppi. A key difference is found in the display technology they use: while the IPS tech employed by Apple tends to be sharper, brighter and with better viewing angles, Samsung's Super AMOLED reigns supreme on contrast and energy-efficiency, plus we quite like the more heavily saturated colours it produces.

It might look small and delicate, but the Galaxy Alpha packs a punch in the hardware department. It houses an octa-core (1.8GHz Cortex-A15 quad + 1.3GHz Cortex A-7 quad) processor, ARM Mali-T628 MP6 graphics and 2GB of RAM. Samsung has admittedly been accused of using benchmark boosters in the past, but this phone turned in some of the best scores we've seen.

In Geekbench 3.0 multicore we recorded 3184 points, putting the Galaxy Alpha behind only the Google Nexus 6 (tinyurl.com/nsvbpp7) and Samsung Galaxy Note 4 (tinyurl.com/mrvcqkg), and miles ahead of the Apple competition.



More interesting was its SunSpider performance. The iPhones have always ruled this benchmark and, yes, they still do. But the Galaxy Alpha sits on the iPhone 5s' heels with its 438.9ms result, a better result than any other Android phone to date (in *PC Advisor*'s testing experience).

Graphics performance is phenomenal. The Galaxy Alpha's 26fps in GFXBench 3.0 Manhattan matches that of the iPhone 6, tying the two in joint-first place. Its 31fps in T-Rex is beaten only by the Sony Xperia Z3 Compact (tinyurl.com/o6pvrer), iPhone 5s, 6 and 6 Plus (tinyurl.com/o9rx9un).

The Galaxy Alpha doesn't support storage expansion via microSD, but it does offer 32GB as standard, though. That'll be plenty for most users, and those who run low should look to the cloud.

The connectivity specs are strong, with the latest 802.11ac Wi-Fi with 2x2 MIMO and Samsung's 4G LTE (Cat 6) and Wi-Fi pairing Download Booster technology, Bluetooth 4.0, NFC and GPS. All the Galaxy Alpha lacks is an IR booster.

It doesn't sound exciting, but the 12Mp camera built into the rear of the Samsung Galaxy Alpha supports 4K UHD video at 30fps and real-time HDR for use in tricky lighting, and it takes a decent picture.

At the front is a 2.1Mp camera that's all you need for video chat.

Samsung's Galaxy Alpha runs Android KitKat with Samsung's own TouchWiz software. KitKat with TouchWiz is notably different from vanilla Android, but we think it's reasonably intuitive in use.

In the Settings menu you'll find the most obvious difference. Rather than a standard list, you'll find rounded icons arranged into new categories such as Network connections, Connect and share, and Sound and display.

Samsung, as ever, preinstalls a lot of software, but in the Galaxy Alpha you are at least able to hide shortcuts to those in which you're not interested in the app tray. Some software is more useful than others, and much of it doubles up on what Google's own apps offer.

The Galaxy Alpha has a 1860mAh battery inside that, in our experience, you'll likely need to charge every night. However, the Ultra Power Saving mode introduced with the Samsung Galaxy S5 (tinyurl.com/nhdz6od), which can significantly prolong the last little bit of juice by turning off inessential functions and entering a greyscale screen mode, is also present.

Verdict

By putting build quality before specification, Samsung has produced a truly desirable, premium phone with a mid-range price. **Marie Brewis**

SMARTPHONE

Acer Liquid Jade





£199 inc VAT

Contact
- acer.co.uk

Read more
- tinyurl.com/oou4fLx

Specifications
Android 4.4.2 KitKat; 5in (720x1280, 294ppi) IPS display; Quad-core Mediatek CPU, 1.3GHz; 2GB RAM; 8/16GB internal storage; microSD card slot (up to 32GB); 13Mp rear camera; 2Mp front camera; Video recording at up to 1080p; Wi-Fi 802.11b/g/n; Bluetooth; A-GPS; dual nano-SIM; 2100mAh battery; 69x141x7.5mm; 110g

Build: ★★★★☆
Features: ★★★☆☆
Performance: ★★★☆☆
Value: ★★★½☆

★★★½☆

When Acer announced the Liquid Jade, it said that the phone would cost a maximum of £229. It achieved its target of £199, which is the official price placing it at the bottom end of the mid-range. For us, £150 and below is classed as budget.

This puts it in a tricky position and there are some decent budget smartphones around from Motorola and Nokia, plus there are some outstanding mid-range devices available for a little bit more than the Liquid Jade – the Honor 6 (tinyurl.com/oybqjva) at £249 springs to mind.

Acer is known for making cheap devices, but the Jade certainly doesn't feel particularly budget. It's by no means in the same class as the LG G3 (tinyurl.com/Lkspk7y), HTC One M8 (tinyurl.com/o2zgj7w) or iPhone 5s (tinyurl.com/mz8jhLf), but we didn't expect that. What is impressive is the screen-to-body ratio on the front, which is partly where it gets its good looks from.

The phone looks and feels nice in the hand, with its smooth curves and a nicely thin and light design. It has a desirable nature and is easily Acer's best smartphone to date in the area. A couple of things to point out include the way the rear cover attracts fingerprints and marks, which detracts from its stylish looks.

Although the rear cover is ergonomic in the hand, the camera sticks out a fair way and using the Liquid Jade on flat surface, such as a desk, is near-impossible as it simply from side to side.

For your money you get a large 5in screen, but anyone expecting a Full HD resolution will be disappointed. It uses 720p HD, which spread across the big display results in a pixel density of 294ppi – it's not ideal but doesn't look awful.

There's decent brightness on offer if you crank things up, and good viewing angles, too. However, we found the display to be unresponsive at times, which is frustrating.

Hiding underneath the exterior is a Mediatek 1.3GHz quad-core processor and 2GB of RAM. That sounds reasonable on paper, but in practice the Liquid Jade isn't the smoothest of performers.

We could be forgiving if the device lagged out during demanding games or similar activities, but it struggles with the simplest of tasks. We're talking unlocking the phone, opening apps calling up the recent apps menu – all of which cause a visual delay to varying degrees.

This is backed up by the benchmark results with the Liquid Jade only managing 1188 in Geekbench 3, 7fps in the T-Rex GFXBench graphics test and 1464ms in SunSpider. Those numbers are similar to the older original Moto G 4G, but Motorola's phone (tinyurl.com/q5ln5xq) offers noticeably smoother performance.

The specs aren't the kind to blow anyone away, but the Acer has a 13Mp rear-facing camera. It shoots at 16:9 by default and you can adjust the ISO manually should you wish to do so. Video can be captures at up to Full HD resolution and we particularly like the 'favourite shot' feature, which adds another button alongside the regular shutter for taking panoramas, HDR shots and other modes. The main downside is the slow performance, as it can take an age to shoot and process just one image. Upfront is a more regular 2Mp camera.

Remaining specs are basic, so there's Wi-Fi (b/g/n) and Bluetooth but no NFC, IR blaster or 4G LTE support. So that's partly why Acer has achieved the relatively cheap price tag. It's worth bearing in mind that there are budget phones with 4G such as the Moto G 4G and EE Kestrel (tinyurl.com/kf2Lccw).

Interestingly, the Liquid Jade is a dual-SIM phone, which might be handy if you're the kind of person who carries around two different mobile phones. There's a single tray for both, but if you want to use two SIMs, then you'll have to sacrifice adding a microSD card.

It's two SIMs or one, plus a memory card and you might want to make use of that since there's only 8GB of internal storage on the Liquid Jade as standard.

On the battery side of things, a non-removable 2100mAh battery will see you through the day but realistically no further. Acer does offer CPU limiting to save power, but you won't want to drop performance. There's also a Power save app that lets you customise how you want to save battery.

On the software front, the Acer runs Android 4.4.2 KitKat. The UI is relatively 'vanilla', but with Acer's green colour running throughout. The main change is the recent apps menu, which displays a grid rather than a list.

Aside from the laggy performance, it's disappointing to see a lot of bloatware on the Liquid Jade. There are a lot of preinstalled apps including Acer Cloud, Acer NAV, Acer Portal, Acer Extend, Quick Mode and Easy Hotspot. Even worse is the fact you can't uninstall them.

Verdict

The Liquid Jade might look and feel premium, but at the end of the day it's a letdown in terms of performance. It might be one of the best phones Acer has produced but it's outpaced by some even cheaper phones – namely the Moto G in its various models. ☒ **Chris Martin**

PORTABLE HARD DRIVE

Transcend ESD400 1TB

£420 inc VAT

Contact
- uk.transcend-info.com

Read more
- tinyurl.com/p94rx4h

Specifications
1TB portable flash drive; available in 128-, 256-, 512GB, 1TB capacities; One Touch Backup button; 450mm USB 3.0 cable; 92x62x10.5mm; 53g (81g with cable)

Build: ★★★½☆
Features: ★★★½☆
Performance: ★★★★☆
Value: ★★★★☆
★★★★½

Transcend Memory's ESD400 goes up to 1TB size, yet still takes up next to no space and weighs just 53g. But the price of this technology in your pocket is currently around £420 for this capacity.

A suedette slip-on cover is included, a useful addition since the soft glossy plastic top can be easily scratched just by carrying in a bag with loose objects.

Like Samsung's T1 (tinyurl.com/qhajrmt), which follows the ESD400 and similar mSATA-based pocket flash drives, the low mass plasticky build actually makes the product too light to use confidently. Especially in this example where the cable weighs almost as much as the drive, and its intractable stiffness means the drive simply won't lie straight anywhere on the desk.

Get past this minor annoyance, and you have a very speedy piece of storage in the palm of your hand. And although expensive at 42p/GB, it's cheaper than the Samsung T1, and is easier to operate since the latter forces software installation just to use the drive the first time.

Like some other models in Transcend's drive range, the ESD400 includes a One-Touch backup button. Here, it's so discreetly situated on one edge you could almost miss it. So if you have your own backup regime this superfluous addition shouldn't even get in your way.

We measured speeds up to 433MB/s in OS X using QuickBench, and up to 415MB/s sequential reads in Windows 8.1 using CrystalDiskMark. Sequential write speeds were somewhat lower, perhaps even lower than we now expect with flash technology, but still decent at 370MB/s (OS X) and 338MB/s (Windows 8.1).

If you use Windows 7, speeds will be much slower again, though, as neither Microsoft nor Transcend will provide a UASP driver to unlock full speed. We saw performance capped here at 296MB/s sequential reads and 270MB/s for writes. And where stacked 4kB random reads and writes flew by at 132- and 149MB/s in Windows 8.1, here they now remained at single-thread speeds of 22.9- and 58.3MB/s.



Verdict

It's almost too light but the ESD400 is also, just, the cheapest mSATA flash portable drive we've seen. For keeping a thousand fast gigabytes in a tiny and lightweight plastic widget, the Transcend ESD400 comes recommended. ☒ **Andrew Harrison**

HARD DRIVE ENCLOSURE

Inateck FE2006

£15 inc VAT

Contact
- inateck.com

Read more
- tinyurl.com/qzb8e9w

Specifications
Empty enclosure for 2.5in SATA SSD or HDD; accepts drives 7- or 9.5mm; USB 3.0 with UASP; JMicron JMS567 chipset; USB 3.0 cable; 130x82x14mm; 63g without drive

Build: ★★★½☆
Features: ★★★★☆
Performance: ★★★★½
Value: ★★★★½
★★★★½

Inateck supplies a range of useful empty enclosures for holding your choice of SSD or laptop hard disk. Five of the six available are billed as tool-free, including the FE2006.

It's a lightweight plastic shell comprising two pieces – a tray that supports any SATA drive of 7- or 9.5mm height, and a detachable cover that secures the drive in place. The top slides on moulded rails before snapping closed to make a neat, integrated pocket drive.

The empty enclosure weighs 63g, and if you add a lightweight SSD as we did to test it – here a Samsung 840 EVO itself weighing only 52g – then the result can be something almost too insubstantial.

Get past the plasticky semi-matt ABS finish and you may find one of the best performing USB 3.0 drive solutions currently available.

Note that Inateck does not support Windows 7 with this enclosure, so while the drive will operate, it will only do so without the benefit of UASP mode. The Unattached SCSI Protocol is required to unlock speeds above 300MB/s and native command queueing (NCQ), which greatly increases small-file throughput speed.

In our tests with the Samsung SSD inside, using CrystalDiskMark 3.0 as benchmark software, we saw sequential read speeds up 413MB/s. That puts this enclosure and SSD combination in good company, if a little short of the best USB 3.0 storage we've tested, such as the Samsung T1 (tinyurl.com/qhajrmt), which got closer to 440MB/s.

Where the FE2006 pulled ahead was in its sequential write performance. The fastest we've seen to date has been 395MB/s. Tested on an Asus laptop with Windows 8.1, the FE2006 with its Samsung SSD delivered 424MB/s.

Small random reads and writes were relatively quick too, at 67- and 53MB/s respectively.

Tested in Mac OS X, the FE2006 and Samsung 840 combination set a new record for write performance – 427MB/s sequential writes, averaged with data from 20- to 100MB.

Sequential reads were very good at 431MB/s. And taking the average of small files (4- to 1024kB), random reads were 192MB/s and random writes 201MB/s.



Verdict

The Inateck FE2006 is a simple way to house a loose laptop disk or SSD. ☒ **Andrew Harrison**

STREAMING DEVICE

NZXT Doko

£99 inc VAT

Contact
■ nzxt.com
Read more
■ tinyurl.com/n9ur8f6

Specifications
Windows streamer; Wonder Media 8750 CPU; 256MB DDR3 RAM; HDMI 1.3 output (max 1920x1080 at 30fps); 3.5mm audio output; 10/100/1000 ethernet; 4x USB 2.0 ports; 50- to 80ms latency; 108x121x29mm; 320g

Build: ★★★★☆
Features: ★★★★☆
Performance: ★★★★☆
Value: ★★★★☆

★★★★☆



Plenty of people, including us avid gamers at *PC Advisor*, got pretty excited when Steam boxes were announced. At last, we'd be able to hook up an unobtrusive PC to our TVs and play games from the comfort of our sofas, console-style. The trouble is, they were just expensive miniature PCs, and you still needed your main PC to run the game. Fortunately, NZXT has come up with a better solution: the Doko.

It's an unassuming little black box with four USB ports on the front. It runs silently and sits almost unnoticed among your set-top boxes beneath your TV. But what it can do is amazing, especially considering the price. Basically, it does everything your PC does, which means you can listen to music from Spotify, watch Netflix or iPlayer, or fire up your favourite game and shoot people (or race cars).

Once you've hooked up the power supply, an HDMI cable to your TV and the network cable to your router at the rear, you need only attach the peripherals you want to use to the USB ports at the front: keyboards, mice and game controllers are all on the menu. NZXT has a list of compatible devices on its website at tinyurl.com/pLurupo, but we found that everything we tried worked fine, from Logitech to Saitek and Genius keyboards and mice. Currently, webcams and headsets aren't supported, so chatting with friends while gaming or via Skype isn't possible with Doko.

On your PC, it's a simple case of downloading the Doko software and running it. After accepting the new firewall rule, which pops up, the software instantly found the Doko box on the same network and on the TV, the Doko interface displayed the PC's name and a video-like play button.

Using the mouse connected to the Doko box, you can click it and you'll see your PC's desktop. There are precious few options – one being to mute the audio at the PC end – so it's very nearly plug and play.

Once you have your desktop running on your TV, you can use it as normal. Audio is routed via HDMI along with video, so aside from an ergonomic desk to sit at, the experience is like having your PC attached directly to the television.

NZXT says you need a gigabit ethernet connection for playing games at 1080p, 30fps, but we found you can get away with a 100Mb/s connection if that's what you're stuck with and you're not playing multiplayer Call of Duty where every millisecond counts. There's support for wireless bridge systems and powerline, but you'll need a reliable and fast connection if you want stutter-free gaming, and only a wired gigabit ethernet connection will give you that.

Even then, we saw a bit of stuttering and dropped frames when streaming HD video, and the eagle-eyed will notice a very slight reduction in image quality. However, we found the latency okay for single-player games.

The Doko's own interface needs some polishing as buttons can get lost in the wallpaper, but you shouldn't need to use it after the first-time setup. The Doko software didn't always find the box, either, telling us to check the network connections, despite the built-in troubleshooting utility reporting a successful network test.

When the connection is established, however, we saw no reliability problems and no dropouts, which is exactly how it should be. The Doko should be transparent: you should quickly forget it's there.

The best part is the price. At £99, it's considerably cheaper than a Steam box and unless you demand more than 30fps at full HD, you should be happy with the video and audio quality it delivers. If you don't want to play games, there are plenty of software utilities that let you remotely connect to your PC, but you'll still need another device such as a laptop or tablet, to run that software or app. And if you want to use your TV as the display, you'll need a way to connect that laptop or tablet to it.

For those looking for a way to stream HD video from their PC to a TV, a media streamer is likely to be a cheaper option, such as the Western Digital WD TV (tinyurl.com/krjqkt9).



Verdict

The NZXT Doko is very much a niche product, but it does a good job of solving the very specific problem of playing PC games on your television without needing the computer to be physically there in the room. ☒ **Jim Martin**

VIRTUAL HEADSET

Zeiss VR One

£119 inc VAT

Contact
- zeiss.co.uk

Read more
- tinyurl.com/q9zrjmt

Specifications
Supports smartphones with display size between 4.7- and 5.2in; see-through front shield; supported distance between wearers' eyes is 53- to 77mm; 100-degree field of view; ports to plug in the smartphone audio and charging connectors; ventilation openings to ease airflow and prevent fogging of lenses; internal tracking by smartphone sensors; stereo side-by-side format for 3D pictures and videos; 165x130x82mm; 438g

Build:
Features:
Performance:
Value:



Fully immersive virtual reality is gradually becoming a concept that we can envisage making its way into many homes in the near future, both as a new aspect to gaming and as a way of watching movies and TV shows. For years this has seemed like a distant- and futuristic dream, but with the launch of the Zeiss VR One, it's finally become a reality.

The headset is similar to Samsung's Gear VR (tinyurl.com/n7Lpd9k), but works with either the iPhone 6 (tinyurl.com/Lnkvjkk) or Samsung Galaxy S5 (tinyurl.com/nhdz6od). The Gear VR works only with the Galaxy Note 4 (tinyurl.com/mrvcqkg).

The Zeiss VR One is a well-built piece of kit that certainly looks like it's worth the £119 you'll pay for it. It consists of a white case, with a shiny black portion on the front, a heavily padded portion at the back that helps make the headset more comfortable to wear, and a sturdy head strap that's easy to adjust.

There's a separate smartphone tray that slots into the side of the headset with a satisfying click (see the image below). During testing our iPhone 6 slotted in easily, and didn't obstruct the front-facing camera that's used for some apps.

A VR headset is never going to be truly comfortable to use, and we found that our neck began to ache during testing. It was also heavy on the nose where there's no padding.

We've tried the Samsung Gear VR and it felt just as uncomfortable, so right now it seems that comfort is the next battle for virtual reality headset makers.

You can fit the headset over a pair of glasses, although it isn't as comfortable to wear.

Apps

This is where things begin to disappoint. As we mentioned earlier, it's early days for the technology, and as a result there are currently a paltry four compatible apps, all of which are buggy.

Getting started is easy – select the app you want to use, slot in your smartphone and your good to go. Unfortunately, none of the apps work this smoothly.

The VR One AR app is simply an augmented reality app that uses the cardboard cube that comes in the box to show you 3D avatars. This is fun for about five minutes, but that's it. Plus, we found the app didn't always work and when it did it induced motion sickness.

Next we tried launching the VR One Media app, which is a hub that links you through to other VR One compatible apps. Right now for the iPhone that's just the aforementioned VR One AR and VR One Cinema, which lets you watch movies from your smartphone in a fun, 360-degree 3D cinema.

Once again there were times when the app didn't work at all, instead just showing the cinema environment but nothing on the screen and no controls to help us begin a movie. The lack of instructions also meant it took us a few minutes to work out how to use the app even when it was working. There was also an issue that caused the display to flip upside down at one point, which was less than ideal.

For iPhone users, that's all you get right now. For Samsung Galaxy S5 owners there is an extra app – VR One Spaceflight. This is a game that lets you take a fly a spaceship, which is controlled by moving your head.

Other VR apps are available in Apple's iOS App Store and the Google Play Store, but since they haven't been designed specifically for the VR One they may not work.

We can expect more apps in the future, but right now there are so few that we'd strongly recommend waiting for developers to build more apps (and less buggy ones at that) before buying this device.



Verdict

Once there are more apps, the VR One could be the start of something amazing. For now, however, it's a device with which you'll soon get bored with. **Ashleigh Allsopp**

SMARTWATCH

Withings Activité

£320 inc VAT

Contact
■ withings.com/uk
Read more
■ tinyurl.com/nos546s

Specifications
iOS 7 or later; Android 4.3; Bluetooth Low Energy needed; silent alarm; day and night motion sensor; water resistant up to 50m; CR2025 battery cell; watch, 36.3mm in diameter; strap fits wrists up to 195mm; 37g

Build: ★★★★½
Features: ★★★★☆
Performance: ★★★★½
Value: ★★★½☆

★★★★☆

There are plenty of smartwatches to choose from and the wearable market is ever growing. If, however, you want a device that looks like a traditional watch, then the Withings Activité activity tracker is well worth considering.

As you can see from the examples (right) Withings has expended a huge amount of attention on the style and design of this watch to make it stand out from the crowd. The idea here is that the watch is fashionable, and we'd say the firm has hit the mark with the Activité.

Designed in Paris, the Swiss-made analogue watch is housed in a '316L' stainless steel case topped with domed 'unbreakable' sapphire glass. It's supplied with a French calf leather strap (brown or black), though, a silicone one is also in the box should you want to wear the Activité for sport and the like. The straps can be easily swapped with no need for tools thanks to the quick release spring bars.

As well as its good looks, the Withings Activité is fully waterproof to a depth of 50m (5ATM) and unlike most wearable tech we've reviewed, the device is small and light – just 11.6mm thick and 37g in weight.

All of this is great and you probably can't wait to get your hands on one, but there is a barrier







PC ADVISOR RECOMMENDED

– the price. With most smartwatches priced at around £150 to £200, the Activité is the most expensive we've seen at a whopping £320. That's the price of fashion we guess and perhaps the price isn't too bad for a watch this good looking.

If your pockets aren't deep enough to cope with the price tag, Withings has recently announced the Activité Pop (tinyurl.com/kxnulny). Priced £119, it's made from plastic, but looks just as good.

Good looks aren't everything, though. A smart device needs to offer more. First off, it's not a smartwatch as we would define one – it can't provide notifications and such like. What it is is an analogue watch with a fitness tracker built-in.

You can use it disconnected from a companion device, but it will store information for only 38 hours without synching. When there is a connection, the Activité will change the time according to time zone.

As you can see, there is your usual analogue hour and minute hands, plus a third smaller dial. This shows your daily goal progress – currently how many steps you've taken out of a target 10,000.

Connected to a smartphone or tablet, you use the free Health Mate app to get more detailed information about your activity. After all, the dial doesn't give you an exact number.

Beyond steps, you can get information on how many calories you've burned, distance covered and the amount of time you have been active. The Activité will detect if you're walking or running. It will also track sleep automatically if you are happy to keep it on in bed. You'll get details on time it takes to fall asleep, duration, cycles and interruptions.

Via the app you can set an alarm, and interestingly you can double-tap the glass front of the Activité to check what time it will go off. This isn't obvious, though, and you need to stay still for five seconds before it will work anyway. There's no way of stopping the 'silent alarm', which is a series of 12 vibrations.

You might think that the Activité is packed with tech considering the price, but it doesn't have a heart rate monitor, nor does it measure elevation. These are hardware related and can't be added, but future software updates will bring new functionality.

If you need to check the watch in the dark, then you'll need to switch on a light because the device doesn't have a backlight. It doesn't glow in the dark either, which is a shame.

There's one other thing to note, although it is pretty niche. If you own a Withings Pulse (tinyurl.com/oktpobh), you can't use it at the same time as the Activité watch. To use both, you'll have to have a user account for each device.

The Activité is compatible with iOS 7 or higher, and Android 4.3 Jellybean. As you would expect, it connects over Bluetooth, but you don't need a constant connection for the watch to function.

If battery life is something putting you off buying one of the current crop of wearable devices, the Activité delivers a tasty eight months, according to Withings. The firm is even kind enough to supply a spare battery and you can change it yourself with the supplied tool. It's pretty easy since it's a standard button type (CR2025).

Verdict

The Activité is a stunning watch, the most attractive we've seen by a long shot. The price is high, though, and there are a few things missing such as a heart rate monitor and elevation tracking. ☒ **Chris Martin**

ACTIVITY TRACKER

Fitbit Charge HR

£119 inc VAT

Contact
- fitbit.com/uk

Read more
- tinyurl.com/mxwamyv

Specifications
Windows Vista and later; OS X 10.6 and later; OLED display; USB port; lithium-polymer battery; Bluetooth 4.0; water resistant to 1 ATM; tracks 7 days of detailed data; tracks daily total for past 30 days

Build: ★★★★☆
Features: ★★★★☆
Performance: ★★★★½
Value: ★★★★☆

★★★★½



Fitbit has launched two new activity trackers. We looked at the Charge last month (tinyurl.com/pfmq9kh), and here we put the Charge HR through its paces. Both include heart-rate monitors, plus a bunch of other fitness features.

Like the Charge, the HR is an activity-tracker wristband that displays fitness stats right there on your wrist – unlike many of its rivals, such as the Jawbone Up24 (tinyurl.com/oa54gLm), which don't have such a real-time stats display on the band itself.

While the Charge costs £99, the Charge HR is priced at £119. Spending £20 more is tempting because of the additional features the latter offers.

All Fitbits have a MEMS 3-axis accelerometer that measures motion patterns to determine your steps taken, distance travelled, active minutes, and calories burned. The Charge and Charge HR both include a clock, so you can ditch the watch if you like, but many wear the fitness band alongside their wristwatch.

They also come with an altimeter that measures floors climbed, to push you to climb those stairs instead of taking the lift, or to take the uphill route to work rather than the easier flat. Every 10ft elevation you walk or climb is counted as one flight of stairs.

The Charge HR isn't the sports powerhouse that is the Fitbit Surge (tinyurl.com/ndLs935), but you can use it to log workouts and – via the app – see a monthly exercise plan.

Using the MobileRun option, you can track stats such as how far you've run or hiked using your iPhone's GPS. These functions are not yet available on Android.

It's great for recording Average Pace and Split Paces, and also offers music controls so you can use it to select and shuffle songs on your iPhone. You can view runs from the past four weeks, and tap specific runs for an expanded view, where you can view steps, calories, and active minutes taken during your MobileRun.

Both wristbands also measure the duration and quality of your sleep, which is an often-forgotten aspect of leading a fit and healthy lifestyle. Sleep detection is now automatic. In the past you had to tap or push a button as you drifted off to the land of nod – which meant that this action was occasionally missed.

If your phone is nearby you can set the Fitbit Charge and HR to show incoming call notifications using Caller ID.

Heart rate tracking

So far, so similar for the two Fitbit Charges. What does the HR offer that's missing from the Charge? First off, the HR is designed for more active users than the Charge – gym regulars (but not nuts), joggers and the more dedicated keep fit, rather than the moderate exerciser.

The main difference, however, is that the Charge HR also monitors your heart rate, and lets you see how you're doing on the wristband as well as on the smartphone app. Unlike other monitors, it doesn't require a device to be strapped to your chest. It's all done on the wrist, which means you'll get a more complete picture of your heart rate as it is on all day and night.

The device does this with Fitbit's proprietary PurePulse optical heart-rate technology. This uses safe LED lights on the underside of the wristband to detect blood volume and capillary-size changes under pressure. When your heart beats, your capillaries expand and contract based on blood volume changes. PurePulse LED lights on the Charge HR reflect on to the skin to detect blood volume changes.

Fitbit says that the LED lights are safe for skin and are on the visible spectrum, similar to the domestic house lights. They are very low power so will not burn the skin, and are programmed to shut down if your device freezes or doesn't see the right signal.

PurePulse allows users to track workout intensity and calorie burn with algorithms that provide insight through interactive charts and graphs on the app and Fitbit dashboard. The heart-rate icon on the HR's display tells you if you're in one of three heart-rate zones. These zones can help you optimize your workout by targeting different training intensities, and are calculated based on a percentage of your estimated maximum heart rate.

When it comes to design, both the Fitbit Charge and Charge HR are very similar. Comparing the two next to each other shows that the lesser-functioned Charge, strangely, is very slightly wider than the HR.

The Charge – not having to worry about tracking heart rate – boasts a much longer battery life of 7- to 10 days, compared to the HR's 5+ days. When we have tested the Charge HR for longer we'll update this review with our own battery test results.

Both are water resistant up to one Atmosphere, which theoretically means they can be submerged to 10 metres, but in reality it means each will withstand not much more than splashes and a quick dousing. Neither should be worn in the shower or when swimming. The Surge is more water resistant (five Atmosphere) than these two.

While the two Charges look similar we much prefer the HR's watch-like strap and buckle, which feel less likely to slip off. Fitbit has improved the Charge's clasp, following complaints about the previous model Fitbit Force's looser clasp, but the buckle is a real bonus for the HR. I'd go as far to say that it alone is worth the extra £20!

Verdict

The Charge HR is only £20 more than the Charge, and offers both continuous heart-rate monitoring and a better-designed strap and buckle. As such, we think it's a more compelling option. ☒ **Simon Jary**

SMART SCALES

Fitbit Aria

£99 inc VAT

Contact
■ fitbit.com/uk
Read more
■ tinyurl.com/k447ytL

Specifications
Windows XP/Vista/7/8; Mac OS X 10.5 or later; wireless 802.11b; WEP/WPA/WPA2 personal security; automatic (DCHP) iP setup; backlit screen; displays weight, BMI, user selection; 4x 1.5V AA batteries; measure range 9- to 158kg; (312x312x33.4mm); 1.93kg

Build: ★★★★☆
Features: ★★★★☆
Performance: ★★★★☆
Value: ★★★★☆
★★★★☆



Fitbit might be a market leader in wearable tech, but one of its products cannot be worn on the body. The Fitbit Aria is a smart scale that measures your weight, body fat percentage and BMI. It wirelessly syncs these stats with your Fitbit Dashboard and mobile apps, and is a great partner for the Fitbit activity trackers.

Powered by four AA batteries, the Aria is certainly one of the most stylish scales around. It is available in chic black or white, topped by 0.3in of glass. The LED display is clear and can be read easily even through blurry just-woke-up eyes.

Body fat percentage is the total mass of fat divided by total body mass; body fat includes essential body fat and storage body fat. For most women, 14- to 31 percent is a healthy range. For men, it's closer to 6- to 24 percent.

The Aria measures body fat percentage by using a body impedance method. It has four sets of ITO electrodes that shoot a small 180 micro amp current up one leg and down other to measure body impedance. (Electrical impedance is the measure of the opposition that a circuit presents to a current when a voltage is applied. Body impedance uses a current to ascertain body fat percentage.)

No electronic scale is going to be completely accurate at body fat percentage rating, but the Aria will give you a decent idea. Because this measurement can be subjective, the scale's body fat reading may not match other scales or the results of manual methods such as callipers, says Fitbit.

BMI stands for body mass index. It looks at body fat in relation to height and weight and tells you if you're in the healthy range.

If you have a BMI above the healthy range you are at raised risk of the serious health problems linked to being overweight, such as type 2 diabetes and heart disease.

A BMI between 18.5 and 24.9 is a healthy range, showing that you're a healthy weight for your height. Below that and it suggests you are underweight. Above and you're overweight, according to the BMI rules. Over 30 and I'm afraid that the BMI rules say you're obese.

Of course, if you have lots of muscle weight then the BMI might not mean much to you. But you'll know in your heart whether those extra pounds are muscle or fat.

The Fitbit Aria's LED display identifies you by name, then displays your weight and body fat percentage. It then shows you that it is syncing that data to your account.



The Aria recognizes up to eight individual users, so works for the whole family. Some may find setting up this up tricky, but once done the scale works out who's who using historical data. Everyone's info is private by default.

Fitbit tracker users don't need to have an Aria scale, but its wireless syncing with a Fitbit account means you don't have to manually input your weight. Simply step on the scales and the Aria does the rest.

As with any scale make sure that it's in the same place each time you weigh yourself, as scales can give different readings depending on the flatness of the floor. Don't put it on carpet as it will make you lighter, which is nice but cheating.

Some users have complained about the Aria's accuracy, but placing the scales in the same spot and weighing yourself at the same time each day should give you consistent readings. If the device is picked up and moved between measurements, Fitbit says the scale will calibrate the next time it is used for weighing. Up to two consecutive weigh-ins will then be required before the scale is recalibrated and again displays consistently accurate measurements.

Fitbit suggests that if you have concerns about the scale's accuracy, you should weigh yourself at least five consecutive times. By the fifth weigh-in, you should see accurate measurements consistent within 1lb.

Verdict

If weight loss is one of your fitness goals, then the Aria is a great tool to combine with your Fitbit activity tracker. ☒ **Simon Jary**

ACTIVITY TRACKER

Xiaomi Mi Band



£28 inc VAT

Contact
■ mi.com/uk
Read more
■ tinyurl.com/qz3yvcr

Specifications
Sleep and fitness tracker; compatible with Android 4.4+/iOS 7.0+; 14x9x36mm aluminium alloy core; IP67 water- and dustproof; Bluetooth 4.0; 8mm 41mAh battery, 30-day life; 13g (5g tracker); 157- to 205mm silicone strap

Build: ★★★★½
Features: ★★★★☆
Performance: ★★★★☆
Value: ★★★★★

★★★★½

PC ADVISOR RECOMMENDED

Xiaomi is not a well-known brand in the UK, but outside our little island it's huge. Bigger than huge. Offering top-quality devices at amazing prices, the fact Xiaomi's Mi Band fitness tracker offers unrivalled value is not at all a surprise.

Priced just £28, it's £10 cheaper than the JawboneUp Move (tinyurl.com/L3davz6), and significantly cheaper than its Fitbit rivals.

But it's not just the price that makes the Mi Band a better choice than the JawboneUp Move. While that device looks like something out of a Christmas cracker, the Mi Band is an elegant black silicone band with a sandblasted aluminium alloy core and shiny milled edges.

Xiaomi says the Mi Band has been subjected to temperatures between -20ºC and 70ºC, drop-tested from 1.2m and corrosion-tested for cosmetic resistance. Even so, we found that after a week on close inspection the Mi Band shows some signs of wear and tear, but no more than would any other silicone strap.

At an incredibly light 13g (14g on our scales with the band, 5g for the tracker alone) you barely notice the Mi Band on your arm, and with eight adjustment holes it'll fit any wrist from 157- to 205mm. It's also hypoallergenic, so even those with the most sensitive skin will be able to use the Mi Band. I can vouch for that.

Faced with the Move's splashproof design Xiaomi brings to the table full waterproofing to 1m with IP67 certification, so you could wear this fitness band in the bath or shower, and clean the band following a workout.

But by far the best thing about the Mi Band when compared to its rivals is its class-leading battery life. Until now fitness bands were either rechargeable, offering about a week's life, or contained a small replaceable battery that might last six months. The rechargeable Mi Band lasts a full 30 days, according to Xiaomi - and it really does. After a week's use the battery in our Mi Band had drained just 25 percent.

The manufacturer claims this outstanding battery performance is possible through a combination of an ADI military-grade accelerometer with ultra-low power consumption (less than one fifth of similar devices), a Dialog DA14580 low-energy Bluetooth 4.0 chip and a super-thin 8mm 41mAh battery. To charge the battery you'll need to remove the Mi Band core and attach it to a proprietary USB cable.

The Mi Band has three LEDs that when lifted in a checking-the-time movement flash to show how close you are to your daily activity goal. The gesture itself is tricky to get the hang of, although the Mi Band will also vibrate when you've hit your goal, and you can pair it with the Mi Band app on iPhone or Android to drill down into the specifics. That vibration alert also extends to phone calls if you so wish, which is handy when your phone is in a bag or pocket and you have in your headphones or simply don't hear it ring, and you can use it to set a gentle alarm to wake you in the morning.

One small gripe is that no English instructions come in the box with the Mi Band. We spotted a QR code that enabled us to figure out that we needed to download the Mi Band app, but some users may need a little bit more hand-holding than this. Once you've installed the app you're prompted to set up a Mi account, providing details on your gender, age, height and weight, then specify a daily fitness goal. You're then able to pair the band to the app, and thereafter Xiaomi's fitness band is very intuitive in use.

Upon opening the app the Mi Band will automatically sync with your phone over Bluetooth, updating the information on the number of steps you've taken that day or how many hours you've slept. This is shown as a circular graphic to make it easy to see how close you are to your ultimate goal. You can tap on either of these illustrations to view a hourly report of activity, which is interesting when monitoring your sleep, with light- and deep sleep plotted on a chunky bar graph. This level of detail is available only for that day, but you can also compare performance over previous days.

The Mi Band app will tell you the number of steps you've taken, distance travelled and calories burned. It can also distinguish between running and walking, and in the settings you have access to Jumping rope and Sit-up activities, allowing it to more accurately measure your activity.

The beauty of the Mi Band's sleep monitoring is there is no button to press to begin tracking – it's automatic, and it's also pretty accurate. Even if we took off the band for a couple of hours before we went to bed, leaving it lying motionless on the table, the Xiaomi Mi Band wasn't fooled. It'll tell you how long you were in bed for and how much of that time was spent awake or in light- or deep sleep.

Activity tracking is less accurate, but the Mi Band is flawed only so much as any other fitness tracker. We found we could gain bonus steps by vigorously shaking our arm or brushing our hair, for example, but when walking and watching the app it accurately tracked our steps.

You can share your sleep or activity data too, but integration with other fitness or social apps is one area in which the Mi Band falls down. It'll hook up to WeChat, Picasa, Line and Facebook, but only if those apps are preinstalled on your phone. If they aren't, you'll have to guess what they are from their icons, which is particularly difficult now that the Picasa app has been replaced with Photos.

Verdict

The Mi Band is an excellent-value, lightweight fitness band with great battery life. ☒ **Marie Brewis**

STORAGE DRIVE HUB

Lexar Professional Workflow HR1

£49 inc VAT

Contact
■ lexar.com
Read more
■ tinyurl.com/o4z62ez

Specifications
Memory card reader hub; modules available for SD card, CompactFlash cards, Sony XQD and CFast 2.0; USB 3.0; 256- or 512GB flash module; 20W (5V, 4A) mains plug; 151x108x85mm

Build:
Features:
Performance:
Value:



The Lexar Professional Workflow HR1 is a storage drive hub aimed at photographers, allowing you to transfer and back up your photo and video files from multiple memory cards at the same time.

When first unpacked, the HR1 is simply an empty plastic rectangular black box. On the front it has four bays that take the Lexar's unique reader modules and drives, with each connected via a USB 3.0 Type B plug and port inside.

The back of the HR1 hub has an inlet for DC power adaptor, and a single USB 3.0 connection. The card readers are bought separately and come in a variety of types for different card formats. There's a module for regular size SDHC/SDXC (UHS-I and UHS-II) as well as smaller microSDHC/microSDXC; CompactFlash UDMA 7; Sony XQD; and CFast 2.0. These modules vary in price from £17 to £36 depending on type.

As well as these six card readers, there's also a choice of two flash storage options. These are available in 256- and a 512GB capacities. At just £153 for the larger 512GB SSD, these look like good value.

Many storage peripherals take fancy designs and aluminium casings these days, especially ones designed for use with Apple products. But Lexar has taken a different approach. The HR1 Hub, the card readers, and SSD modules are all made of lightweight black plastic with rounded corners, glossy smooth on the front and textured on the sides.

The HR1 comes with a mains power plug and a USB 3.0 cable in the box. It is simple to connect to any computer with an available USB 3.0 port. The drives are backwards compatible with USB 2.0, but will operate at much slower speeds.

The reader modules slide into the HR1's bays. However, because of its low weight and tall design, we needed a second hand just to keep the hub from sliding backwards whenever attaching the readers.

We were supplied with two CompactFlash card reader modules and two SD card modules, as well as one DD512 SSD module with 512GB capacity. But the beauty of this system is that you can purchase just what you need for your specific workflow.

It could be that you want to fill the HR1 with four CF card readers for quick video and photo transfers if your time is most important in your work. Or maybe you want to max out your storage needs using four 512GB SSDs, for a fast, versatile and cost-effective 2TB total capacity setup.

In terms of versatility, there is more good news. The design allows each of the modules to also be used individually as a standalone device via a separate USB 3.0 connection. A USB 3.0 cable comes with every card reader module and SSD storage drive. This allows you to use the card reader or SSD drive on location, as they are light, compact and when used individually do not even require an external power source.

We tested the hub and modules with a combination of SanDisk and Lexar's own Professional SD cards, with transfer speeds reaching 95- and 160MB/s for UDMA 7 '1066x' CompactFlash cards.

The 512GB DD512 SSD performed well, too. It reached speeds of 419MB/s for reads and 232MB/s for writes. However, we encountered a serious issue with this flash drive. When using it docked in the HR1 Hub, the DD512 SSD would typically become disconnected from the Mac OS after a few minutes.

Sometimes it remounted again, other times it was not available at all and had to be physically removed and reinserted into the Hub to get it working again. This problem didn't seem to occur when the SSD module was connected directly to a computer, which suggests a power supply issue with the HR1 Hub itself.

Every creative is probably asking the same question. How fast can I transfer my footage and will it speed up my workflow?

To answer that we used a 4.55GB test folder with 45 video files ranging from 33- to 186MB in size. This was transferred from CF and SD media cards onto the desktop of a Macbook Pro with Retina display. Its internal flash drive could operate at around 800MB/s, so was not slowing down any transfers.

Copying 4.55GB from SD card to the MacBook's desktop took one minute, 49 seconds. Copying the test folder from the MBP's internal SD card reader to desktop was a little faster, taking one minute, 39 seconds. So in our tests the internal SD card reader of the MacBook Pro had a slight advantage, but either card readers should be good enough.

Next, we tested with CompactFlash cards. As no Apple Mac computers come with built-in CF readers, this is where the Lexar readers will be most useful. Copying 4.55GB from CompactFlash card took 32 seconds. Copying the same folder from two CompactFlash cards at the same time took 45 seconds.

Here we see that copying data from two CF cards simultaneously only slowed down the transfer speed by a few seconds. We feel that's nothing to worry about as it still offers a considerable time saving.

However when we tried to copy four cards simultaneously (two CF and two SD) to the MacBook Pro, the same test folders together took a total of three minutes 30 seconds to copy over. That's not such an impressive result, and trying such simultaneous transfers would not be of such benefit to anyone looking to read multiple media cards quickly.

Verdict

We are impressed with the innovative modular design and the ability to customise the Professional Workflow HR1 hub with multiple card readers. ☒ **Dominik Tomaszewski**

BLUETOOTH SPEAKER

Etekcity Roverbeats T12 Wireless Mobile Speaker

£30 inc VAT

Contact
- etekcity.com

Read more
- tinyurl.com/q22vcdx

Specifications
6W (2x 3W) wireless speaker; Bluetooth 3.0 + EDR (33ft range); NFC; AUX input; 100Hz to 18KHz frequency response; 2200mAh battery charges in three hours, lasts 10; 1A (5W) Micro-USB charger supplied; 195x86x71mm; 382g; 1-year warranty

Build: ★★★★☆
Features: ★★★½☆
Performance: ★★★½☆
Value: ★★★½☆
★★★½☆



Etekcity's 6W (2x 3W) Roverbeats T12 Wireless Mobile Speaker looks and sounds much better than it costs, making it a decent budget Bluetooth speaker for blasting out tunes in the bedroom, back garden or on the beach.

With support for Bluetooth 3.0 + EDR, you can pair this wireless speaker with any phone, tablet, PC or laptop that supports the standard, allowing you to achieve louder volume and better sound than what is available from their own built-in speakers. Pairing is a cinch, but you can further simplify the process if your phone or tablet supports NFC. Simply turn on the Roverbeats T12 and place the back of your device against its base. The T12 will automatically establish a connection, and you can immediately begin playback over Bluetooth.

If your device doesn't support Bluetooth, the Roverbeats T12 also has a 3.5mm AUX connection, and a short cable is supplied in the box. Used in this way you'll need to leave your phone or tablet beside the speaker; when used over Bluetooth the T12 has a 33ft range. We experienced the odd dropout when walking from room to room, so keep in mind that thick walls and obstructions can limit its operating distance.

Another thing found in the box is a mains Micro-USB charger, which is a rare occurrence these days. Rated at 5V 1A (5W), it'll take around three hours to charge the Roverbeats' 2200mAh internal battery, which should then average 10 hours playback. That's excellent for a budget Bluetooth speaker.

The Roverbeats T12 has a lot more to offer than NFC and a mains adaptor, of course. We love its funky red design with black speaker grille and, far from the plasticky case we were expecting to find, out of the box we were met with a soft-touch, silky-feeling speaker box that looks more expensive than it costs.

We weren't so keen on the always flashing LED on its top, however. This is either alternating between blue and green if no devices are paired, flashing blue when connected over Bluetooth, or flashing red to show you the battery is running low. There's no other way of knowing how much power remains.

On the base are two large rubber pads to prevent the T12 vibrating on a hard surface. Etekcity says these are also heat-resistant, and you'll find air vents at the device's base. We didn't find any problems with excessive heat in our testing.

Three buttons top the T12, allowing you to play and pause audio, adjust the volume and skip tracks. There's also a power button on the bottom, so don't forget to switch it off when not in use – it won't automatically enter standby mode.

With two 3W speakers inside the sound quality is better than that of many portable Bluetooth speakers, and placed at the front of the unit at slightly different angles the T12 also does a good job of sending that sound around the room. It's not going to be audible in every corner of the house, but for use in a bedroom or on the beach it's ideal. The Roverbeats T12 is also said to support enhanced bass and we found it pretty good in this respect, given the price.

The Amazon listing page suggests the Roverbeats T12 supports answering phone calls and TF cards (SD) up to 64GB, which is odd because it does neither. The former, at least, is something of a surprise. With a phone paired and playing music, playback will simply pause when your phone rings. There is no mic inside the T12, so no option to conduct group conversations over the speaker.



Verdict

The Roverbeats T12 is a stylish speaker that's portable enough to take on your travels and loud enough to fill a room. ☒ **Marie Brewis**

BLUETOOTH SPEAKER AND SMART LAMP

Lava BrightSounds



£39 inc VAT

Contact
■ lavaaccessories.co.uk
Read more
■ tinyurl.com/kom2zt3

Specifications
5W speaker; available in teal or grey; Bluetooth/3.5mm AUX connection; supports hands-free calls; ambient night light with dimmer control; IPX4 water-resistant; rechargeable lithium-ion battery offers eight hours continuous music playback, or up to 10 hours continuous light function (charges in 3- to 4 hours); rubber carry strap; 190x95x103mm

Build: ★★★★½
Features: ★★★★½
Performance: ★★★★½
Value: ★★★★½

★★★★½

Smart light bulbs are the latest addition to the smart home, but what about when you're away from home? We love this Lava BrightSounds smart lamp and portable Bluetooth speaker, and reckon it's one of the best gadgets you'll take camping this year.

(Okay, so the Lava BrightSounds is not strictly a smart lamp in the same sense as some smart light bulbs, which can be controlled via a mobile app to switch on and off at various times, change their colour to suit your mood and so forth. But it's dimmable, portable, waterproof, rechargeable, takes phone calls and plays music, and it uses an LED- rather than traditional incandescent bulb, which makes it longer-lasting and more energy-efficient. And that makes this the smartest lamp we've ever seen.)

A good-looking all-in-one Bluetooth speaker and LED lamp, the Lava BrightSounds offers great value, just £39 at Amazon. Roughly three quarters of the tall, rectangular unit comprises the lamp component, housed in plastic and adjustable through everything from a soft glow to bright white light. The top quarter is a wraparound speaker mesh, available in grey or teal, which seems to fire out sound in every direction. Four control buttons lie flush up top, along with the status LED and Lava logo.

For a Bluetooth speaker it's pretty big, but not so much when you consider that the Lava BrightSounds replaces both the camping lamp and Bluetooth speaker in your backpack. And it's still easily portable.

A useful rubberised carry handle lets you cart around camp the BrightSounds without smothering lamp or speaker, but this Bluetooth gadget isn't great only for camping. IPX4-certified water-resistance (splashproof – or festival mud-splatter-proof – rather than fully submergible) makes it perfect for sunbathing on the beach or chilling out in the garden; and its dimmable LED lamp makes this the ideal kids' nightlight – able to allay their fears of the dark and play them lullabies as they gently fall asleep.

With a lithium-ion battery inside, this Bluetooth speaker and smart lamp can offer up to eight hours of music playback, or up to 10 hours use as a lamp, all off a three- to four-hour charge from empty. There's no auto-off function, which makes sense given the lamp, so the flashing blue LED that signals successful Bluetooth pairing serves as a handy reminder to switch off the speaker when you're done. If you're using the Lava BrightSounds in the home you can also use it while plugged into the mains via a USB charger (none is provided, but you can use the same one you use for your phone, along with the supplied Micro-USB cable).

One drawback of devices such as this is that you can't separate lamp and speaker should one become faulty. However, LEDs offer much longer life than incandescent bulbs, and the two function independently of each other in any case.

Lava doesn't specify the Bluetooth standard used by the BrightSounds, but we found good range as we walked from room to room with a paired smartphone. It will pair with any phone, tablet, laptop or PC with Bluetooth connectivity, and for those devices that lack such connectivity there's a 3.5mm AUX input.

Once paired those four buttons at the top can be used to skip tracks or, with a long-press, adjust the volume, answer or reject calls when used with a smartphone, or turn on and off and dim the light. These are tactile, which aids finding them in the dark, although it can be tricky to then read their legends. That's a very minor gripe.

We tried the Bluetooth hands-free calling, and found the music would automatically pause and resume during and after the call. We had to speak up to ensure our recipient could hear us, but at our end the call was clear and perfectly audible. A short press of the Bluetooth button answers a call, while you can long-press to reject or double-press to reconnect with the last caller.

It's not just call quality that's good from the Lava BrightSounds either. We had its 5W ultra-wide speaker on full whack and didn't hear a hint of distortion. It's loud enough to fill a room with sound, and for a budget Bluetooth speaker audio quality is more than acceptable. No matter what we threw at it, the Lava BrightSounds coped admirably.

Verdict

We're pretty taken with the Lava BrightSounds. It won't appeal to everyone, but if you're planning a camping trip, a BBQ party in the garden, or even just fancy a cool reading- or night light, this all-in-one Bluetooth speaker and LED lamp is worth a look. ☒ **Marie Brewis**

PC ADVISOR RECOMMENDED

WIRELESS SPEAKERS

KEF X300A

£800 inc VAT

Contact
- kef.com

Read more
- tinyurl.com/ppk6qtj

Specifications
Powered speakers with active crossovers; 4.7-litre volume; 130mm Uni-Q magnesium/aluminium mid-bass drivers with 25mm concentric aluminium dome tweeters; 24-bit/96kHz USB DAC; 2x 2 W (HF) and 2x 50W (LF) Class AB amplifiers; 49Hz to 45kHz (-6dB) specified frequency response; balance and gain controls; 15W consumption per speaker 280x180x215mm (without rear heatsink, 243mm deep with); 7.5kg each

Build:
Features:
Performance:
Value:
Overall:



The KEF X300A speakers remain one of the finest loudspeaker systems for your computer, period. Now KEF has increased their reach, quite literally, with the help of a little Wi-Fi connectivity. In our listening tests we heard the same great sound, but with the added option of AirPlay to liberate the speakers from an audio cable connection.

There are two ways this 'wireless' edition differs from the original KEF X300A – it comes solely in a white vinyl finish, rather than black only. And it adds a Wi-Fi network adaptor internally to let it connect to 802.11g wireless networks. Peripheral to that, there's also the reliable standby of an ethernet port available, the preferred way to pipe media files reliably.

With either network connection, Apple devices such as a MacBook, iPhone or iPad can be easily paired for playing music. And besides Apple AirPlay you can also use the X300A speakers on a network using UPnP.

On first sight, the KEF X300A Wireless still looks like a regular bookshelf hi-fi speaker, albeit one with an unusual dual-concentric speaker driver that KEF calls Uni-Q. There's no grille option so these drivers are always on display.

Instead of the classic tweeter above mid-bass driver layout, the tweeter is embedded into the centre of the main driver. Coincident wavefronts from transducers that cover most the audible frequency range is usually considered a Good Thing. These KEF Uni-Q units typically create a more even tonal balance from different listening positions, and assist stereo imaging. This was demonstrably the case here, as we found a remarkably consistent sound from different locations in the room.

A two-position switch on the back (Stand/Desk) helps you adjust the acoustic characteristics for either positioning; this tweak is usually made to the bass response, reducing the low-frequency output slightly when used closer to a room boundary, such as a wall.

The KEF X300A Wireless speakers resemble the long-running brand's typical fare of high-fidelity loudspeakers over the last few decades; but unlike most hi-fi speakers these are self-powered, with four separate channels of amplification. They also feature active crossovers, working in the analogue domain, for splitting the sound into appropriate treble and mid/bass frequency bands before arriving at the amplifiers.

In this system, the amplifiers and supporting electronics all live inside the speakers – and that includes D-A convertors (DACs) to let you feed the X300A Wireless speakers with a digital signal, up to the 24-bit/96kHz standard, through a Mini-USB 2.0 input. It's notable that the amplifiers used are high-fidelity Class AB designs (50W mid/bass, 20W treble), and not the music-crushing Class D type that is universally used in budget audio kit.

The main carcass of the speaker box resembles course-grained metal, although it's a vinyl wrap over thick-walled MDF. Build quality is essentially faultless. These speakers feel incredibly solid and they're weighty too at 7.5kg apiece.

On the back of the left speaker – the boss unit of the pair – there's USB port for digital audio from a PC, as well as a 3.5mm minijack analogue input. A second USB port sends the signal to the right-hand speaker over a long USB cable.

To tailor the sound for either Desk or Stand use there's the small slide switch here, while a rotary trim knob lets you adjust overall volume gain. You'd normally set your source to its maximum volume, then turn up the gain control to reach the highest output you'd expect to need; then reduce volume as required again on the source component.

While music can be piped into the speakers using microwave radio instead of connecting wires, they are clearly far from wireless, as each requires a mains power lead; plus there's the USB cable that tethers the two boxes together. This also limits somewhat how far apart you can space the two speakers, although the supplied USB cable is a few metres long and for desktop use at least that ought to be enough.

These are incredibly insightful loudspeakers, and yet tonally deliciously neutral. We ran them from a MacBook Pro over USB, playing a variety of 16-bit ripped CD lossless files, as well high-resolution 24/96 material. And then we turned to the wireless connection, streaming high-bitrate internet radio and lossless audio files.

Regular CD music had a clarity and sparkle that we've not heard at this price level before – the overall grip and cohesiveness of sound outclassed what you might have expected from, say, a traditional stereo hi-fi amp and loudspeaker combination of £300 each.

Voices were fixed naturally in the space between the speakers, and free of unwanted chestiness from the cabinet or sibilance from the all-metal drivers. Acoustic music played convincingly, capturing the air and space around instruments while showing authentic timbre of guitars or violins, for example. And the Uni-Q helped lock the sound such that the soundfield remained consistent in size and spread.

Given weightier music material, the X300A could also step up and keep up. In fact their tight, focused bass made them great for rock and jazz material, remaining in control even at higher volumes where other speakers start sounding messy.

Verdict

The KEF X300A stand clearly above any style-first speaker routinely made to complement a PC or laptop.

☒ **Andrew Harrison**

BATTERY CHARGER

Upp Fuel Cell Energy

£149 inc VAT

Contact
- beupp.com

Read more
- tinyurl.com/jwtmocc

Specifications
USB 2.0-compliant device; 5V; 5W; 1000mA; USB Type A Socket; PEM Proton Exchange Membrane Micro-USB Type B Socket; 35Wh hydrogen battery; Upp Fuel cell, 119.5x40x48mm; including dust cap adaptor, 124.5x40x48mm; Upp Fuel cartridge, 90.5x40x48mm; Upp Fuel Cell 235g; Upp Fuel Cartridge 385g

Build: ★★★★☆
Features: ★★★½☆
Performance: ★★★½☆
Value: ★★★½☆



At first glance, the Upp Fuel Cell Energy battery charger appears absurd – huge, heavy, expensive, and difficult to top up; and that's ignoring its alarming onboard warnings of being highly flammable and combustible.

But the Upp Fuel Cell has two things going for it. For starters, it's the first generation of an interesting new technology that could hold a lot of promise for all us in the dreamed-for clean-energy future. And secondly, it beats normal rechargers in certain situations: most notably in environments or longer-term situations when there's no electricity within reach for recharging.

Upp is no standard battery power bank. It uses hydrogen fuel cells, which are often touted as the future of clean energy. It converts hydrogen into water, using chemical energy to release electrons that generate a current.

Each refillable fuel cartridge contains 2.23g of hydralloy C5 – a hydrogen fuel combining titanium, zirconium, vanadium, iron, chromium, manganese and hydrogen – which can generate enough power to charge up to five iPhones or two to three Android smartphones (which have larger batteries than the iPhone), or one tablet.

The charger costs £149, with the Hydrogen Micro Generator and one reusable Fuel Cartridge. Upp's Fuel Cell is not a battery, so you can't charge it from the mains like most power banks. This means its principal usage environment is when you're away from the power grid for longer than conventional battery packs allow.

You can buy multiple cartridges to take with you. You get one with the original unit, and can purchase extra cartridges for £49 each, which then cost £5.95 to refill when you exchange an old used one at one of the Upp resellers.

The charger's design is very neat. The Micro Generator connects magnetically to the cartridge. You connect your battery-starved devices via the USB port at the top of the Generator section.

Push the power button to start the PEM (Proton Exchange Membrane) electrochemical reaction that generates electricity to recharge the device. That sounds more impressive than what goes on with most battery power packs.

As the top unit has its own internal battery to power fans and exhaust water vapour it too can run out of juice. Imagine the irony. You charge this top unit via the USB port in the dust cap, which features a tiny plastic cover that looks rather too easy to lose.

It's big: the generator is 12cm long, and the cartridge is 9cm. And it's heavy: the two sections together weigh a mighty 620g.

The Upp Fuel Cell promises a week's energy for your smartphone, and should charge a dead smartphone up to five times before requiring a new fuel cartridge. Remember that some phones have larger batteries than others.

Each Fuel Cell Cartridge is rated at a whopping 25,000mAh (the iPhone 6 has an internal battery of 1,850mAh).

The Upp Fuel Cell weighs 235g, and the cartridge weighs another 385g, totalling 620g.

In comparison the LimeFuel Blast L240X Pro (tinyurl.com/k7ysfuh) battery pack, with a similar 24,000mAh capacity, weighs 505g and costs around £100.

If you're away from an electric socket for a long time, then maybe lugging round multiple 385g cartridges makes more weight and economical sense than several L240X Pro power banks. But for a few days away, taking one or more lighter rechargeable power banks makes more sense.

Another option would be taking a bunch of very affordable and smart Intocircuit Power Castle power packs, which are rated at 11,200mAh and cost just £21 each. Each bank weighs just 265g.

The lack of an LED display or lights showing the remaining charge is initially a disappointment, but fear not as far more detailed data is available via the Upp app (iOS and Android), which tells you the exact percentage of energy left in the cartridge. It's full of detailed data on an easy-to-understand dashboard, and points the way forward for all consumer electronics power solutions.

Set to EcoMode you can tell the Upp to switch off when you reach a certain charge – the default is 85 percent. Smartphone batteries last longer if not charged right up to 100 percent each time.

You buy the replacement cartridges via fuel cell exchangers listed on the Upp website. These are few and far between right now, but if the technology takes off we'd expect more to be added.

Hydrogen is highly flammable, so isn't the Upp rather dangerous? The seal created when the two sections magnetically join stops leakage. When disconnected the device switches off the supply.

Upp says that, despite the combustible warnings, you are permitted to take the charger on to planes in your hand luggage. We charged a camera using the Upp while on the tube in London and got a few worried glances as we put the whole thing together.

As the Generator uses fans to blow air across the fuel cell, you have to use the Upp is a well-ventilated area, and not within a bag like you can a standard power bank.

The Upp has a few other idiosyncrasies you don't get from standard battery packs. For example, when charging it makes a few, disconcerting snapping noises over the slight but constant whirring hiss.

We can see the potential for the Upp in extreme off-grid situations where you are away from civilization for maybe a couple of weeks at a time. A gang of festival goers might take one along to store in their tent and recharge multiple phones.

Verdict

The Upp is too large, heavy and expensive for everyday use. It's an inconvenient solution for all but the most inconvenient of situations. ☒ **Simon Jary**

POWER BANK

Snooper Ventura PB60 10400mAh

£40 inc VAT

Contact
- snooper.co.uk

Read more
- tinyurl.com/oj4ycm4

Specifications
10400mAh power bank; rubberised weatherproof, shockproof casing; rollable design; 1A (5W) Micro-USB input; 1.5A (7.5W) USB output; passthrough charging; 140x73x20mm; 140g; one-year warranty

Build: ★★★★☆
Features: ★★★★☆
Performance: ★★★½☆
Value: ★★★½☆
Overall: ★★★★☆

Snooper's Ventura PB60 is made of five cylindrical lithium-ion cells, held together with a bright orange silicon housing. This makes the PB60 not only flexible – you can roll it up to fit it into any space available in your rucksack – but easy to see in the dark and resistant to the elements.

While the Ventura doesn't have any certifications as to its waterproofing, a silicon flap that conceals the USB and Micro-USB ports ensures it is both rainproof and shockproof. If you're going camping or to a festival, the Snooper will also be safe from mud splatters and other less welcome spillages.

The only part of this power bank that is exposed to the elements is its power button. Since the Ventura doesn't support auto-on/-off, you'll need to tap this once you've plugged in your device to begin charging.

Another plus point for the PB60 is its passthrough charging: you can charge your device at the same time as refilling its lithium cells. If you're away from the mains, Snooper also sells a portable solar panel kit (£89), which will come in handy.

Even without a mains refuelling source to hand, the PB60 offers 10400mAh of portable power for charging up your phone, tablet, camera or any other USB-charged device. It has a single USB output, restricting it to charging just one of these devices at a time; rated at 1.5A (7.5W), it provides reasonably speedy charging, too.

All power banks lose available capacity through heat generated and voltage conversion, so the 10400mAh on the packet won't be what's available to your phone or tablet. Snooper doesn't specify the Ventura PB60's efficiency, although in our experience most power banks average around 70 percent, with anything higher something to shout about in their marketing materials.

So, you might find with a 100 percent charge the Snooper can deliver 7280mAh of power. How many times this will charge your device depends on its own battery



capacity. As an example, an iPhone 6 has a 1810mAh battery, which the Ventura PB60 might fill four times. Android phones typically have larger-capacity batteries, so you might expect only three full charges.

To show how much capacity remains one of the lithium cells carries four LEDs, which shine through the rubber casing.

Verdict

Snooper's Ventura PB60 stands out in a sea of portable chargers with its unique rollable and weatherproof design. ☒ **Marie Brewis**

WALL CHARGER

iClever 6-Port USB Travel Wall Charger

£18 inc VAT

Contact
- iclever.us

Read more
- tinyurl.com/mpa4dwc

Specifications
Six-port USB hub; 6x 12W (5V, 2.4A) USB; 50W total output; 100x69x27mm; 180g; 12-month warranty

Build: ★★★★☆
Features: ★★★½☆
Performance: ★★★★☆
Value: ★★★½☆
Overall: ★★★★☆

The amount of tech we take on holiday with us is astonishing. You might be carrying a phone, a tablet, a camera, an ebook reader, an MP3 player, a smartwatch and a fitness tracker, plus all their assorted chargers, and if you're travelling with your family you'll be carrying all that for your partner and kids, too. But there are plenty of other holiday essentials we also need to carry, so something has to give.

USB hubs or travel chargers such as this iClever 6-Port Travel Wall Charger offer an excellent solution in such scenarios, letting you leave the chargers at home and just bring a handful of USB cables. They also allow you to charge multiple devices from a single mains power outlet, which may be beneficial for home use, or merely reduce the cable clutter on your desk.

At £18 from Amazon, the iClever sounds a little pricey – in fact, it's more than twice the price of Lumsing's DCH-5U five-port alternative (tinyurl.com/Lk22ogy). But we prefer this version for several reasons.

The iClever is much better built than Lumsing's plasticky charger, with rounded edges and a soft-touch black finish. It's also a fraction of the size, making it easier to fit into your suitcase. The iClever six-port travel charger is just 100x69x27mm and 180g, so you'll barely notice its presence.

The iClever also has an extra USB output over the Lumsing, and all six are rated at 12W (5V, 2.4A), which translates to fast charging for your phones, tablets and any other devices that charge over USB.

The legends are clearer, too, and by labelling each output with its rating rather than a device name iClever doesn't leave you wondering whether it's okay to plug an iPhone into an Android output or vice versa.

But it's worth bearing in mind that the iClever has a maximum total output of 50W, rather than the 72W required to simultaneously operate all six ports at full-speed.



(By comparison the Lumsing offers just 30W.)

Don't assume that this means with four ports in use there will be just a trickle of power available to the last pair, though. iClever builds in SmartID tech, which identifies your device and its unique charging requirements, then delivers exactly the right amount of power. And it's unlikely that you would want to plug in six devices that charge at 12W all at once.

Verdict

The iClever 6-Port USB Travel Wall Charger is a useful gadget for those who have multiple devices to charge. It's well-built, powerful and, although it's a little pricey for a charger, is worth the money. ☒ **Marie Brewis**

MONITOR

HP DreamColor Z27x

£658 ex VAT
£790 inc VAT

Contact
■ hp.com/uk
Read more
■ tinyurl.com/nkuf9en

Specifications
27in (2560x1440, 109ppi) LCD monitor; matt anti-glare 8-bit + Hi-FRAC AH-IPS panel; 2x DisplayPort 1.2; 1x HDMI 1.4 (both with HDCP support); 7ms specified GtG response time; 4x USB 3.0, 2x USB 2.0 DreamColor ports; height adjustable stand; 641x655x379mm; 8.8kg

Build: ★★★★½
Features: ★★★★½
Performance: ★★★★½
Value: ★★★½☆

★★★★☆



The HP DreamColor Z27x is a large 27in desktop display with a healthy pixel count of 2560x1440. This leads to a pixel density of around 109ppi, which helps to reduce visible pixellation. Compare this to monitors with just 1920x1080 pixels in the same sized panel, which at 82ppi appear coarse when viewed at typical operating distances.

This panel is far from Retina-class though – that requires around 220ppi when viewed at normal PC working distances – but it does match the pixel density of a full-HD panel sized around 19 inches along the diagonal.

The Z27x is aimed at professional users who will pay for the extra quality – and that includes improved build and operational details, as well as better image quality. At around £790, it's considerably cheaper than the former price of 10-bit IPS panels, which were once closer to the £2,000 mark.

If the price seems to good to be true compared to 10-bit panels a few years ago, it's because this isn't a 10-bit panel. An updated technology trick has given manufacturers a marketing loophole to let them promise 10-bit colour, even though the panel is still only an 8-bit design.

As we've seen with similar products from LG and BenQ recently, the HP takes an AH-IPS display of 8-bit technology. The LG-made panel used here cleverly fudges the additional colours available to 10-bit native screens through a temporal dithering technique called frame-rate control (FRC), where pixels alternate at high speed between two colours that are available to 8-bit panels, to fool the eye into seeing a third 10-bit colour-space hue. There can, however, be side effects from this cost-cutting measure.

Build quality of the DreamColor is workmanlike but among the best on the market, with a sturdy fully adjustable pillar stand and robust charcoal-grey panel chassis. The LCD panel is supported in a frame with a 20mm bezel all around.

Two DisplayPort 1.2 ports are available, plus one HDMI 1.4 port. With the help of the increased bandwidth of DP 1.2, for instance, the DreamColor can also accept incoming 4K video (specifically up to 4096x2160 pixels), which is then downsampled for viewing on the available 2560x1440 native panel. Framerate (vertical frequency) is limited in this case to 24 progressive frames per second though.

The onscreen menus stand out against the generic and often labyrinthine options found on cheaper consumer monitors. A vertical array of five buttons run up the right side of the bezel, from where it's easy to dig deep by pressing the button alongside the changing OSD text options. Important information such as current working colour space, video delay, serial number and firmware revision can all be called up quickly.

Performance

We tested the main parameters of image quality with a Datacolor colorimeter, connected to a regular 8-bit graphics adaptor on a MacBook Pro (15in, Retina, late 2013).

With the panel set to native colour space, we measured 96 percent sRGB coverage; and 85 percent NTSC and 90 percent Adobe RGB.

Contrast ratio in a chequerboard test reached 790:1 at nominal 75- and 100 percent brightness settings, and 670:1 at a more realistic brightness setting of 167cd/m^2.

Luminance uniformity at different brightness settings was very good, typically within around 5 percent, rising to a maximum deviation of 11- to 12 percent at top at half-brightness setting.

Colour accuracy was impressive, with a 48-swatch test providing an overall average Delta E of just 0.9.

Power consumption was relatively low, reaching a maximum of 58W at full panel brightness, and drawing 33W at a setting of 120cd/m^2.

Judged subjectively, the panel image was cleanly viewable from all angles. Viewed up closer there was some grain clearly evident, likely from the 3H anti-glare hard coating. This was especially visible on white backgrounds such as text documents. Text was reasonably sharp and clear, though.

Some chromatic aberration was also visible on high-contrast edges. This is comparable to the coloured edge highlights found in lower-grade optics, known to photographers as 'purple fringing'. The effect on this HP display was subtle; but once seen users with sensitive vision may find it difficult to 'unsee' it. It was most apparent when the Z27x was used with OS X rather than Windows, and may be an artefact of the OS' sub-pixel rendering, or from LG's Hi-FRC technique for artificially extending colour depth.

Verdict

The HP DreamColor Z27x is a high-performance 2.5K monitor suited to some professional applications. As a company HP is entrenched in Windows, where the panel worked better than with the graphic designer's traditional choice of OS X. For any user, though, the Z27x offers great build quality and comprehensive setup and adjustment functions, while still maintaining essential ease of use. ☒ **Andrew Harrison**

MULTIFUNCTION DEVICE

HP Envy 5640 e-All-in-One

£57.50 ex VAT
£69 inc VAT

Contact
■ hp.com/uk
Read more
■ tinyurl.com/knsx2gt

Specifications
Colour inkjet multifunction; max print resolution 4800x1200dpi; quoted print speed B=12ppm, C=8ppm; actual print speed B=12.5ppm, C=8.2ppm; 1200x1200dpi optical scanner; copier; USB 2.0, Wi-Fi 802.11b/g/n; memory card drive; mobile device support; 6.75cm touchscreen display; 125-sheet main input; 15-sheet photo tray; Auto duplex; 454x410x161mm; 6.8kg; ink cost B=£18; C=£25; print life (pages) B=600; C=415; 1-year warranty

Build: ★★★★½
Features: ★★★★☆
Performance: ★★★½☆
Value: ★★★½☆

★★★½☆

HP's Photosmart range of printers were a revelation when they first arrived at the beginning of this decade. They had all the features any self-respecting digital enthusiast could hanker after and wrapped them up in an elegant package that was topped off with a crisp touchscreen interface. They were, however, pricey. The models from the Envy range are the natural successors to the Photosmarts – highly functional but beautifully presented hardware that's available at an affordable price.



This sub-£70 zone can be a graveyard for design values, with ugly blocky designs the most regular residents, but the Envy is having none of this. We shouldn't perhaps overstate its looks, but the subtle curves and bowline frontage blends with a sleek black exterior that sees the 5640 effortlessly dominate its surroundings. And that's before we peruse such design twists as the exquisite curved door. Pop this open, and a memory card drive emerges from the darkness. On the down side there's no support for USB drives, which will be an annoyance to some.

There's substance to the form too, and the HP's construction values are high. The main paper tray feels well made and can hold a sizeable 125 sheets of paper. In addition, a 15-sheet photo tray takes care of the smaller media. We're big fans of this dual-tray design, and those who move constantly between standard printing and photo-work will appreciate the convenience of having a second input. The rugged construction means the HP sucks in the paper and bowls it out again with not a hint of a ruffle or a jam.

Of course, one of the keys to that streamlined design is, well, the lack of keys. A touchscreen interface takes you through the various options. Admittedly, it's neither the most responsive or the easiest to follow of the touchscreens that we've seen. Some of the options are represented by tiny icons, so you won't always know exactly what's going on, which is rather throwing away one of the huge advantages of an inviting touchscreen interface. But even with these faults, the interface remains rather more enjoyable to use than the unrewarding button control panels employed by lesser lights in the budget printing firmament. It's just that, with a little extra effort, this could have been stunning rather than adequate.

Connectivity is ample. Besides the obligatory USB 2.0 interface, the main draw will be the 802.11b/g/n wireless connection. We had no problems connecting to this, and you can even use it to hook up to HP for extra features and printouts. You can also print to the HP using a smartphone or tablet, and this can be achieved even if you don't have a Wi-Fi network up and running. This isn't a business model, and that explains the lack of ethernet.

Ultimately, though, the 5640's excellence (or not) will be defined by its ability to print and scan to a high level. The scanner doesn't have a particularly flexible lid, so there will be better models for those who need to scan large items (such as books). The scanning software is also a touch cumbersome compared to, for example, the straightforward Epson and Canon interfaces. Those latter software front-ends tend to have a greater range of features available, as well. The 5640 is reasonably swift at scanning, turning out 300dpi output in just 12 seconds. The images looked good, although we weren't convinced that every detail was rendered perfectly, and the colour depth isn't as impressive as we might like.

Printing is rather better. Text can be run off at a rate of 12.5ppm in the Draft mode, and 10.1ppm in Normal. Even the Draft mode is of good quality – if a little light – while the Normal mode is pleasingly fast while offering sufficient quality for most text work. This being an inkjet, you're never going to get laser-quality crispness from text characters, but in Normal mode, the output is dark and reasonably clean. The 0.7ppm Best mode is there for an extra lick of clarity. There is an auto-duplex mode, and this drops performance by around 42 percent – not a bad percentage for a sub-£100 inkjet, although not perhaps one sufficiently high to have you resorting to the paper-saving auto-duplex mode on a regular basis. The graphics output is nicely rendered, and happily free of artefacts, although you don't see the same rainbow of colours bursting out as on Canon prints – HP is still a short distance behind its rival when it comes to colour photos. Speed drops to 8.2ppm for Draft, and a very solid 6.7ppm for Normal.

Rejecting the modern trend for having multiple colour tanks, the Envy has gone back to one unified colour cartridge. The cost of this is surprisingly economical when the XL version is chosen, working out at 6p for a page of colour – this is pretty good for a sub-£70 model, although the likes of the Canon Pixma MG5550 (tinyurl.com/LkwLjde) works out at an even cheaper 4.8p per page. At 3p a page for black, though, it's slightly more expensive than the average of 2.5- to 2.6p.

Verdict

The HP Envy 5640 looks brilliant, and has some very nice features. Its performance, though, doesn't match up to the exterior. Compared to the cheaper Canons, its output isn't as glorious, and its running costs marginally higher. Overall, it's a beautifully turned-out device, but it falls short of inspiring true envy. ☒ **Robin Morris**

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INKJET PRINTERS

They're remarkably cheap to buy, and have remained the technology of choice for casual print jobs. Cliff Joseph looks at five sub-£100 inkjet printers, plus one whose extremely low running costs could quickly turn the bigger price tag into a whole-life saving



CANON IP2850

★★½☆☆

£40 inc VAT • canon.co.uk

With a price of around £40, the Canon iP2850 must be one of the cheapest inkjet printers around. However, that low price makes for a pretty basic device compared to many of the multifunction printers that are now available. There's no built-in scanner or copier, and no Wi-Fi either, so you'll have to connect it directly to your PC using one of those old-fashioned USB cables. And, of course, the lack of Wi-Fi also means that there's no option for printing to an smartphone or tablet.

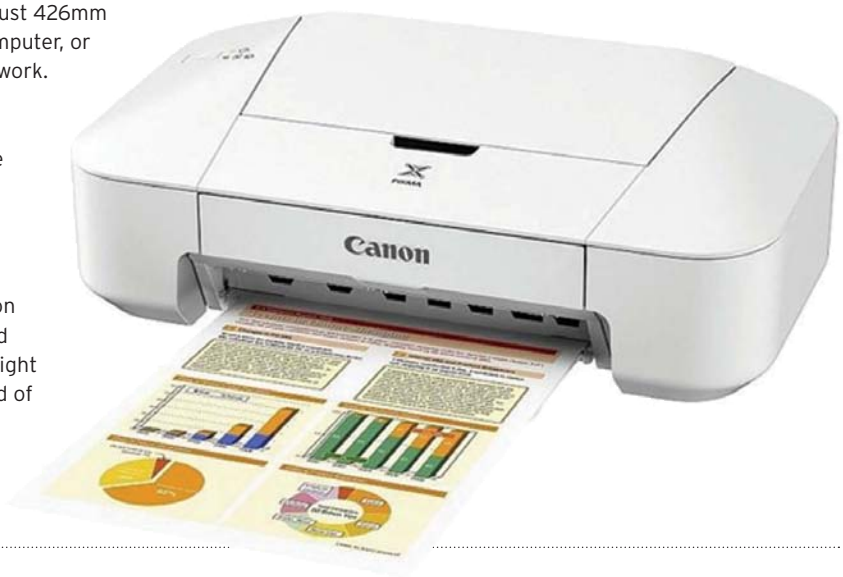
Still, keeping things simple does keep the cost down, and means that the iP2850 is nice and compact too. It measures just 426mm wide, so you can easily sit it on a desk next to your computer, or plug it into a router if you want to share it on your network.

Print quality is good for a printer at this end of the price range. Canon uses a special pigment-based black ink for text printing, which enables it to produce very smooth, sharp text output for letters and other text documents. Colour output is also good, and the iP2850 is perfectly capable of printing decent photos when it needs to.

It may not be the fastest printer around, with Canon quoting speeds of eight pages per minute for text, and 4ppm for colour, but those speeds should be fine for light use at home rather than the day-to-day grind required of an office machine. We were initially a bit disappointed by the cost of Canon's replacement ink cartridges – especially as the three coloured inks are combined together in a single cartridge, which means that you have the replace the entire cartridge even if just one of the ink colours runs out.

Fortunately, the cartridges have come down in price quite a lot recently, and the high-yield colour cartridges now work out at a reasonable 5.3p per page. The high-yield black cartridges cost a little above average, working out at 3.6p per page, but the iP2850 is still a good option if you just need a basic, affordable printer for occasional use at home.

SPECIFICATIONS
Resolution 4800x600dpi
Mono speed 8ppm; colour speed 4ppm
High-yield black cartridge £14.50 (400 pages)
High-yield colour cartridge £16 (300 pages)



CANON PIXMA MG6450

★★★½☆

£90 inc VAT • canon.co.uk

The Pixma MG6450 originally cost £140 when Canon first launched it, but it's now widely available for around £90, so it represents a good option if you need a versatile, high-quality printer for use at home or in a small office. It's available in black or white, and there's a striking bronze model as well.

The Canon MG6450 is a multifunction device that includes a 1200x2400dpi scanner and copier as well as 4800x1200dpi printing. It provides both USB and Wi-Fi connectivity, and you can use it with iOS devices too. The printer has some built-in apps of its own that allow you to print off photos from social media sites such as Facebook.

It's a bit on the bulky side, measuring 455mm wide, 369mm deep and 148mm high, so you'll probably want to put it on a table or desk by itself. However, the MG6450's wireless connectivity means that you can move it around easily enough, and its excellent print quality ensures that it will earn its keep.

Most desktop printers use four coloured inks – cyan, magenta, yellow and black (a colour model known as CMYK) – but Canon's Pixma MG6450 actually uses five different inks. It uses the four standard CMYK inks for colour printing, along with a special pigmented black ink that is used for printing text documents. The pigmented ink produces extremely sharp, clear text, while the other four inks do an equally good job for colour and photo output.

Running costs aren't too bad either – at least for a printer that uses five different ink cartridges. If you use Canon's high-yield cartridges, then straightforward mono printing costs a reasonable 2.3p per page. Colour printing is even better, as that works out at a below average price of around 6p per page.

The MG6450 is fairly speedy as well, as it can manage 15 pages per minute for mono printouts, and 9.7ppm for colour pages. Our only minor complaint is that the 100-sheet input tray is on the small side for a printer as beefy as this one.

SPECIFICATIONS
Printer resolution 4800x1200dpi
Scanner resolution 1200x2400dpi
Mono speed 15ppm; colour speed 9.7ppm
High-yield pigmented black cartridge (for text) £11.50 (500 pages)
High-yield black cartridge £10 (810 pages)
High-yield cyan, magenta, yellow cartridges £11.50 each (715 pages)



EPSON ECOTANK L355

★★★★½

£250 inc VAT • epson.co.uk

Epson's new Ecotank printers mark one of the few genuine innovations in inkjet printing to have appeared in years. Most inkjet printers can be bought quite cheaply, and the manufacturers make their profit by charging eye-wateringly high prices for the replacement ink cartridges. Epson's Ecotank printers take a completely different approach. The printers themselves are more expensive to buy, but the ink is far cheaper, which means that the running costs are dramatically lower when spread over a period of two or three years.

The L355 model costs £250, which is high for an inkjet printer, but the device has a large ink tank bolted onto the side that holds enough ink – included in the price – for 4000 pages in mono and 6,500 in colour. That should last you for about two years, and when you eventually run out of ink you can refill the tank using bottled inks, which are much less expensive than conventional cartridges.

The black ink costs £8 for 4000 pages, or an average of just 0.2p per page, which is far lower than any conventional inkjet printer. The cyan, magenta and yellow coloured inks cost £8 each but they should last for 6500 pages, which works out at 0.4p per page, making the L355 excellent value if you do a lot of colour printing.

Other aspects of the printer's design are more conventional, but print quality is very good for text, graphics and photo output, and the L355 provides both USB and Wi-Fi connectivity for connecting to your PC or home or office network. Epson's iPrint app allows you to print a wide variety of file formats from mobile devices, including Word and Excel files as well as photos. The L355 even includes a fax capability, along with scanner and copier functions. It's not particularly fast for a printer in this price range – Epson quotes speeds of just nine pages per minute for mono and 4.5ppm for colour – but what the L355 lacks in speed it more than makes up for with its extremely low running costs.

SPECIFICATIONS

Print resolution 5750x1440dpi
Scanner resolution 300dpi
Mono speed 9ppm; colour speed 4.5ppm
Black ink £8 (4000 pages)
Cyan, magenta, yellow ink £8 each (6500 pages)



EPSON EXPRESSION XP-412

★★★★½

£90 inc VAT • epson.co.uk

The Expression XP-412 is one of Epson's 'small-in-one' printers, which are designed to be as compact as possible for home users. It's certainly neatly designed, measuring just 390mm wide, 300mm deep and 145mm high, but it still manages to cram in a good range of features, including printer, scanner and copier as well as 100-sheet paper tray. That compact design means you'll have no trouble sitting it on a desk next to your PC. Alternatively, you can move it on to a nearby shelf and just use its built-in Wi-Fi to connect it to your home network.

Text output is good – not quite as smooth and sharp as the perfect curves and lines you can get from some of the more expensive inkjet printers, but perfectly adequate for printing the occasional letter or school report. Photo output is better, producing bright, vivid colours with plenty of detail.

Epson's quoted speeds are on the optimistic side, and it seems that the figures of 33 pages per minute for mono pages and 15ppm for colour output are calculated on the basis of using the printer's lower-quality draft mode. We tested the printer using its 'normal' quality mode, and got far lower output figures of around 7ppm for mono and 4ppm for colour. To be fair, though, those speeds are still adequate for light use at home.

Pretty much the same applies to the XP-412's print costs. Epson's standard ink cartridges are not particularly good value for money, as they don't even provide 200 pages for either colour or mono printing. However, you can get a multipack containing high-yield cartridges for all four coloured inks – cyan, magenta, yellow and black – for about £50; using this will bring the cost per printed page down to about 2.7p for mono output and 8.3p for colour.

Those prices are a little above the average in the inkjet sector, but not massively so, and the compact design of the XP-412 and its support for Wi-Fi make it a good option if you only need an affordable printer for occasional use at home.

SPECIFICATIONS

Print resolution 1440x5760dpi
Scanner resolution 1200x2400dpi
Mono speed 7ppm; colour speed 4ppm
High-yield black cartridge £12.50 in multipack (470 pages)
High-yield colour cartridge £12.50 each in multipack (450 pages)



HP ENVY 4500

★★★½☆

£49 inc VAT • hp.com/uk

With a price of just £49, the HP Envy 4500 is one of the most affordable multifunction printers currently available. It's quite neatly designed too, with a compact, low-profile design that measures just 120mm high and 445mm wide, so you can easily sit it on your desk or on a convenient shelf.

The Envy 4500 also manages to include an impressive range of features for such a low-cost device. It provides both USB and Wi-Fi connectivity so that you can share the printer on a network. It even includes double-sided printing – a feature that is rarely found in low-cost printers such as this.

Print quality for text and graphics is good, and the Envy 4500 is more than adequate for printing out letters or the children's schoolwork. Its photo output isn't dazzlingly bright or fabulously colourful, but that would be a lot to ask from a printer in this price range, and you can still get decent results if you don't mind using higher-quality glossy papers. It's not particularly fast either, although speeds of about eight pages per minute for mono and 5ppm for colour output are still fine for light use at home.

The Envy 4500's running costs are something of a mixed bag, though. If you buy HP's high-yield tri-colour ink cartridge, then colour printing works out at a fairly reasonable 6p per page on average. The high-yield black cartridge isn't such a good deal, and costs something like 4p per page on average, which is well to the top of the range for inkjet consumables. However, the Envy 4500 also allows you to sign up for the 'instant ink' subscription service that HP has introduced. Instant ink lets you print a fixed number of pages each for month for a flat-rate subscription fee starting at just £1.99 a month. That can save you up to 70 percent on your normal printing costs, according to HP, so it's worth checking it out to see whether it can save you some extra cash.

SPECIFICATIONS
Print resolution 1200x600dpi
Scanner resolution 1200dpi
Mono speed 8ppm; colour speed 5ppm
High-yield black cartridge £20 (480 pages)
High-yield colour cartridge £20 (330 pages)



HP OFFICEJET 4630

★★★½☆

£69 inc VAT • hp.com/uk

HP's OfficeJet printers are normally intended for use in businesses and larger offices, but the OfficeJet 4630 is a less expensive model designed for smaller offices or home workers who still need a reasonably fast and versatile printer.

Priced at just £69, the OfficeJet 4630 manages to include all the main features that you would need from a multifunction office device, including a printer, scanner, copier and fax machine. There's an automatic 35-page document feeder as well, so you can quickly scan or copy multiple documents all in one go, and it supports two-sided 'duplex' printing for business documents.

The printer includes both USB and Wi-Fi connectivity for your home or office network, and comes with HP's own ePrint feature for mobile devices. There's no Ethernet port, though, so the OfficeJet 4630 won't be suitable if you have a wired network in your office.

Print quality is good, although the OfficeJet 4630's text output can't quite match the near-laser smoothness of some of the more expensive models in the OfficeJet range. It's still fine for general office use, though, and print speeds of 8.8 pages a minute for mono and 5.2ppm for colour should be fast enough for smaller offices.

The 4630 is a good deal if you need to do a lot of colour printing for presentations or marketing materials, as its three-colour high-yield cartridges offer printing costs of about 6p per page, which is quite competitive.

Oddly, though, the high-yield black cartridge works out at around 4p per page for ordinary mono printing. That's undoubtedly above average for mono printing, so the OfficeJet 4630 won't be the best choice for people who just need to print lots of plain text documents. The cost of the black inks might also be HP's way of trying to get you to sign up for its new 'instant ink' subscription service – which can be a good deal for business users. ☒

SPECIFICATIONS
Print resolution 1200x600dpi
Scanner resolution 1200dpi
Mono speed 8.8ppm; colour speed 5.2ppm
High-yield black cartridge £20 (480 pages)
High-yield colour cartridge £20 (330 pages)




lenovo

INTERNET SECURITY SUITES

Malware is about money now, and the commercialisation of security 'exploits' may have left you more exposed than you think. Simon Williams looks at six mid-range internet security suites

Internet security is no longer just about countering viruses. Although they still exist, viruses are arguably a minor part of the malware now prevalent on the web. More important now is security of personal data. Security exploits aren't about hackers showing off and massaging their egos any more, but about them monetising their malware.

You don't have to be a hard-line hacker, either. You can buy all the software you need, and millions of addresses, on the dark web or even on eBay, if you know where to look. You can buy everything from a denial of service attack – with botwebs for hire – to individual exploits. Custom attacks are available, where the code changes after only a dozen uses or so, making it very hard for internet security providers to block every new variant.

Although the primary concern is to block malware so it doesn't install on your PC in the first place, there isn't an internet security suite made that is 100 percent effective. Worthwhile internet security software should also detect 'zero day' attacks, where the malware is so new it hasn't yet been analysed or had its 'signature' built into internet security protection routines.

The speed with which these analyses are made is an important factor in the level of protection an internet security suite can provide. Some companies now claim a turnaround of under an hour, using information gained from their own customers about similar attacks. The cloud element in security applications is growing more important in speeding up this process.

Newly installed software can be monitored for suspicious activity and then prevented from potentially damaging actions, such as changing registry entries or installing as browser add-ins.

Most internet security suites don't just handle malware exploits. Many also offer file backup, protection of passwords, website checks, online transaction security and other associated tasks.

Backup is a particularly useful combination with malware protection. In a worst-case infection, you can still retain clean copies of important data to reinstate once the attack has been cleared.

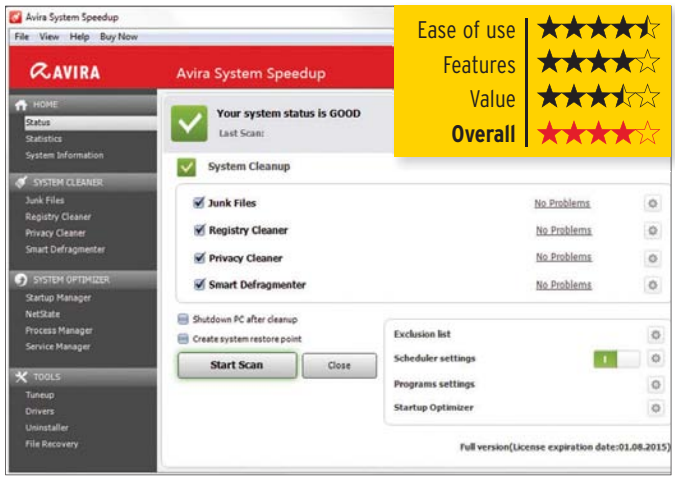
Many suites offer PC tune-up facilities. These often duplicate existing Windows facilities, such as defragmentation and removal of cookies, but several come with extras to determine the applications and utilities loaded at startup and to check you have the latest versions of software and drivers.

Keeping applications up to date is important, as exploits specific to individual programs can be stopped at source using revised code from their producers. Applications like Acrobat, Flash player and Oracle's Java are often targets for attacks.

Six good, mid-range internet security contenders are covered here. We look at their technical strengths and their usability. How easy are they to set up? How much do you need to tweak settings. And how much extra do they offer, on top of their core AV capabilities? If you don't have an internet security suite on your system, it's worth considering one now; and if you do, should you swap to one of these half-dozen?

AVIRA INTERNET SECURITY SUITE 2015

£51 inc VAT (three-PC licence) • avira.com



One of the main providers of free antivirus (AV) software, Avira also sells paid-for variants. Its Internet Security Suite includes most of the key core features. There's an AV scanner, real-time protection, a two-way firewall, and web, mail and social network protection.

There are links to further free utilities, including a social network monitor for parental control and an Android app that gives basic AV and anti-theft protection, including an alarm. What isn't included is any backup or online storage, so you will have to add this separately.

All features are controlled from an old-school control panel, without the sliding tiles or other cosmetics of some of its rivals. It's very functional, though, and easy to work your way around. It hasn't suffered the dumbing down of some other interfaces.

The extra you get in the IS Suite over Avira's free AV is Avira System Speedup. This suite of utilities cleans out unwanted files and stubs, and provides managers for startup processes and auto-run programs not normally available in Windows. These apps are not all duplicates of Windows' own offerings and do offer extra functionality.

The defragmenter, for example, goes through selected drives and indicates the number of fragmented files, before defragmenting.

AV-Test (www.av-test.org) scores the Avira engine at a very good 17.0/18.0 – 6.0/6.0 for protection, 6.0/6.0 for usability and 5.0/6.0 for performance. It gave 100 percent detection of widespread malware and 99.5 percent accuracy in detecting zero-day attacks. The latter score is particularly good, as it detects suspicious activity and doesn't just look for predefined malware signatures.

Usability tests involve checking for false detection of legitimate software and warnings or blocks on legitimate websites. IS Suite had a completely clean bill of health on this. Particularly impressive was the complete lack of false positives on the 425,612 samples tried; the average for the test group was nine.

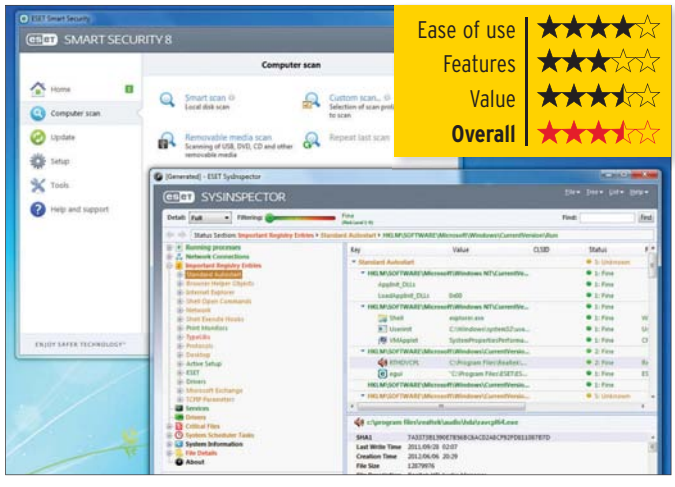
The system performance hit was just two seconds over the five different scenarios used; the group average was double that. This reflects our own results, where copying a 1GB file took 27 percent longer when the Avira software was running a scan, than when not.

It took 46 minutes to scan our 50GB test basket, examining 358,714 files to give a scan rate of 130 files per second. Repeating the scan showed virtually no fingerprinting and took within a couple of minutes of the first, so perhaps it's as well the system load of the software is relatively light.

Avira Internet Security Suite 2015 is a good, solid IS suite with useful extras in the System Speedup app. Technically excellent, it loses a little for lack of any form of backup, but is still a good choice.

ESET SMART SECURITY 8

£50 inc VAT (three-device licence) • eset5.co.uk



ESET blends AV signatures, heuristics and reputation analysis in its Smart Security product, the mid-point in its range of three.

Smart Security 8 includes botnet security, to prevent your PC being seconded to a remote network, a memory scanner to overcome the heavy encryption of malware, and an exploit blocker to prevent attacks on browsers, document readers and email clients.

The suite includes specific modules for AV, anti-spam and anti-spyware, anti-phishing support tied into your browser, a two-way firewall, parental control and scanning of social media sites. It doesn't include online storage or backup and there are few PC tune-up facilities; there are tools for activity monitoring and scheduling, but these aren't as comprehensive as Windows' own.

ESET produces AV utilities for Mac, iOS and Android devices, but these aren't included in Smart Security.

The interface is lacklustre, with a simple menu down the left-hand side of the window and main features filling the rest of the pane. It's easy enough to navigate, though, and windows are improved by one of the best-drawn androids this side of *I, Robot*.

Our scan tests show a fast scanner. It looked at 135,806 files in 22 minutes 41 seconds, giving a scan rate of 99.8 files per second. Repeating the test saw the scanner examine just 9,528 files in 32 seconds, indicating a fair amount of fingerprinting going on to avoid rescanning files which haven't changed.

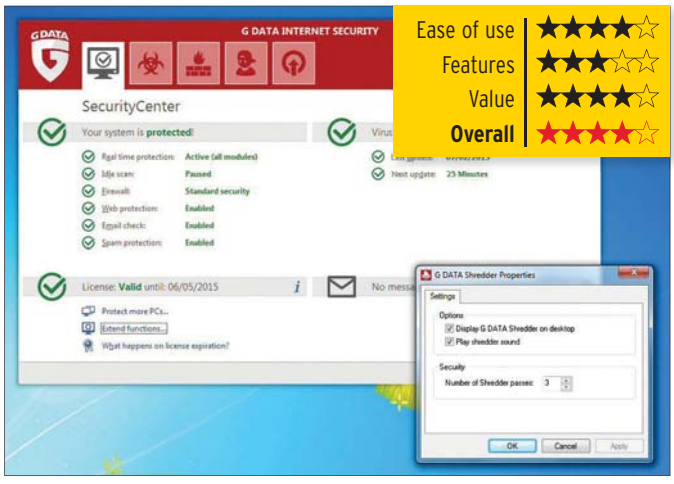
The scanner puts little load on the system, with just a 23 percent increase in our copy test time, with a scan running in the background. AV-Test scored Smart Security 8 at 14.5/18, which is good, but not among the frontrunners. This breaks down into 5.0/6.0 for protection, 3.5/6.0 for performance and a full 6.0/6.0 for usability. The Usability score measures false detections and warnings generated for legitimate applications. During the two-month test period, it produced just three false positives. Performance in detecting widespread malware was a full 100 percent, using 12,327 samples. However, it dipped a little with zero-day attacks, scoring 94 percent and 98 percent, against an average of 94 percent.

Finally, going against the result we saw, the software was measured as giving a five-second slowdown when visiting websites and downloading software, against a machine not running the suite.

ESET Smart Security 8 is an efficient internet security suite, though it has few of the extras that are now standard issue. It's good at what it does and from our tests has a fairly light touch.

G DATA INTERNET SECURITY 2015

£45 inc VAT (three-PC licence) • gdatasoftware.co.uk



G-Data has been in the security business for 30 years and its latest mid-range offering builds on previous development. G-Data Internet Security 2015 includes core modules for AV, anti-spam, a two-way firewall, parental control and online banking protection. There's also an autostart manager, so you can select which applications start at switch-on, and a multi-pass data shredder for secure file deletion.

There's nothing in the way of PC tune-up for cleaning out old code or unused registry entries, and no online storage or backup software. Such facilities are often reserved for top-of-the-range products.

G-Data uses CloseGap technology to extend its dual-engine approach. Running two AV engines in parallel is a good way to increase protection, but it can result in extended scan times and slower performance. CloseGap is claimed to prevent this slowdown, while maintaining the same level of security.

The interface is very straightforward and easy to use, with five large icons at the top of its control window, each of which leads to a pane with setting and status information. Much of the setup is automatic, and it can be installed as a load and forget application.

Despite CloseGap, the performance of the G Data scanner was quite poor on our tests. It took 50 minutes 23 seconds to scan our 50GB file basket, but examined only 8,753 files, giving a scan rate of just 2.90 files/s. Repeating the test examined the same number of files, but this time in just 53 seconds.

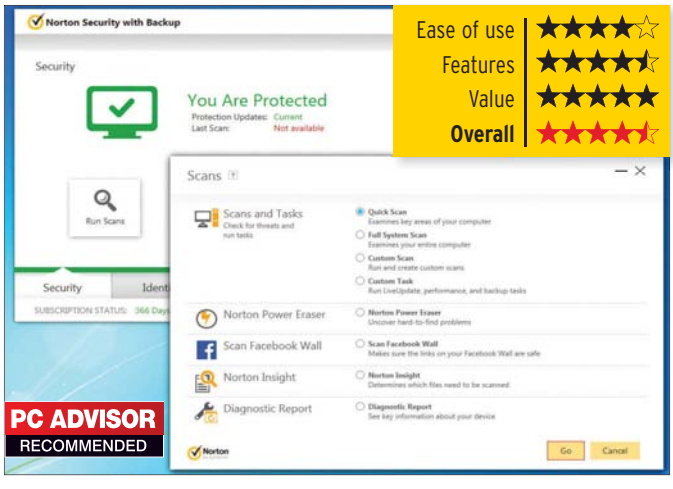
G Data's scanning puts little load on a typical system – just a 20 percent increase in the file copy time in our test. AV-Test scored it at 4.5/6.0 in the performance category, which looks at the effect of the software on performing regular tasks. It slowed the system down by three seconds overall – a second less than the test group average. Under the protection category, which tests its ability to detect widespread and zero-day malware, it scored 5.0/6.0, which breaks down into 100 percent protection against prevalent malware and 96 percent against zero-day attacks. The usability score, which measures false positives when installing and using legitimate software, gave a full 6.0/6.0 with no alerts or blocks seen throughout the period of the test. You're very unlikely to have problems when running your normal applications or installing new ones.

The three different scores combine to give an overall result of 15.5/18.0. This is another good score, though not in the forefront of internet security suites, some of which manage a full 18.0/18.0.

G-Data Internet Security 2015 is £5 cheaper than most of its competition for a three-PC licence and the suite offers most of the same functionality.

SYMANTEC NORTON SECURITY WITH BACKUP

£60 inc VAT (10-device licence) • uk.norton.com



One of the earliest companies in the AV market, Norton is still a very strong player and Norton Security with Backup presents a different value proposition from most of the other products here. Although it costs £10 more than most, this is for up to 10 personal devices. You should be able to cover all your desktops, laptops, tablets and phones on the same licence. As well as AV, anti-spam, a two-way firewall and identity protection, it also provides PC tune-up and backup.

Installation is straightforward and the interface is clean and modern. Five panels fill the bottom of the window, with a reassuring status message above. Select the section you're interested in and the arrow at the end slides the panel down to reveal further icons with options for security, identity, backup and performance.

It's a great idea to build backup software into an internet security suite and Symantec has done well to include 25GB of online storage, which can be shared between all the PCs in your licence. It's enough to store photos and music as well as documents, emails, and so on. The key words, though, are 'between all the PCs'. The online storage doesn't extend to the Mac, iOS or Android devices covered by the product, so you can't use it to share data between them.

The PC tune-up module includes disk optimisation, file cleanup and a startup manager, while the identity protection includes an identity safe and a password generator.

On test, the 50GB basket of files were scanned in 26 minutes, 51 seconds, with 175,311 files examined, giving a scan rate of 108.8 files/s. This is above-average, and when the test was repeated, the scanner checked 23,761 in two minutes, 41 seconds, so a good degree of fingerprinting. The copy test showed an increase of only 11 percent when a scan was running in parallel, so a light footprint on the host PC.

AV-Test scored Norton Security at 16.5/18.0, dropping just 0.5 in each of the three categories. This is a very good score, implying a high level of security without annoying false notifications.

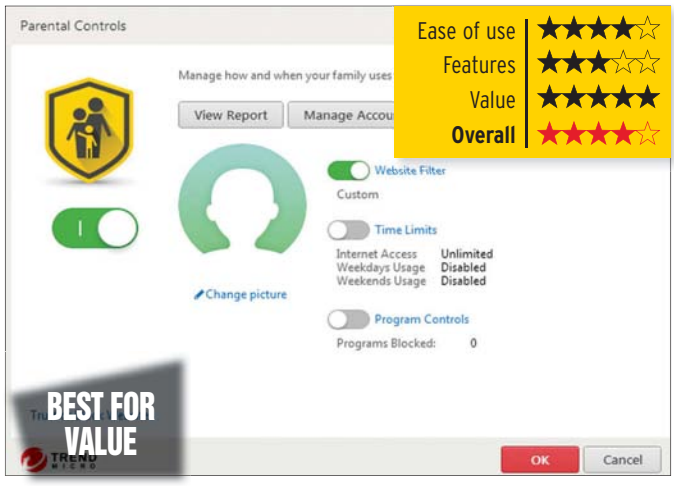
In the protection category, it scored 100 percent at detecting widespread threats, and an average of 98 percent on zero-day attacks, losing it that half point.

The performance category results reflected what we found – that the software puts a light load on a PC, with a total of just one second slowdown under test, against AV-Test's group average of four seconds.

In the usability category, it produced only two false positives when running legitimate software, against a group average of nine seconds. This was with a test sample of more than 425,000 samples.

TREND MICRO INTERNET SECURITY 2015

£42 inc VAT (three-PC licence) • trendmicro.co.uk



Trend Micro, founded 25 years ago, has significantly improved the status of its security offering in the past few years. The latest version of its Internet Security product also manages to slide in nearly 20 percent cheaper than most of its rivals.

The core modules include AV, anti-spam, identity protection, parental control and tune-up. Browser protection takes the form of a look ahead scan in searches, which highlights good and bad sites according to the reputation built from other Trend customers' visits. It can also scan privacy settings in social media.

Trend Micro claims a very fast turnaround for getting signatures for new viruses out to its customers and an independent report from NSS Labs claims an average of under 15 minutes from the company.

This is a PC-only suite, though the top-of-the range Maximum Security product caters for Android and Apple devices as well. Trend Internet Security also has no backup provision or password manager.

There are lots of little, animated icons in the Internet Security interface, with sliding panels and pop-ups adding to the fun. However, it suffers somewhat in accuracy. For example, while running our file scan, the progress counter read 5 percent complete at 17,000 files, but finished within a further 30 seconds, at 17,343 files, rendering the estimate pretty useless.

Scan speed is quite slow, measured at 12.4 files per second, but the load it puts on the system is also low, so scan speed is not that much of an issue. In fact, it took no longer to copy our 1GB test file with a scan running in the background than without.

The software only dropped 0.5 of a point in AV-Test's recent test, giving an excellent 17.5/18.0. When you look at the category results, this translates to a perfect result in the protection category, with 100 percent accuracy on both widespread and zero-day threats.

Although any test uses only a sample of the malware a program will meet in the field and so doesn't mean it will never miss a trick, this level of success is a good indicator of the program's efficiency.

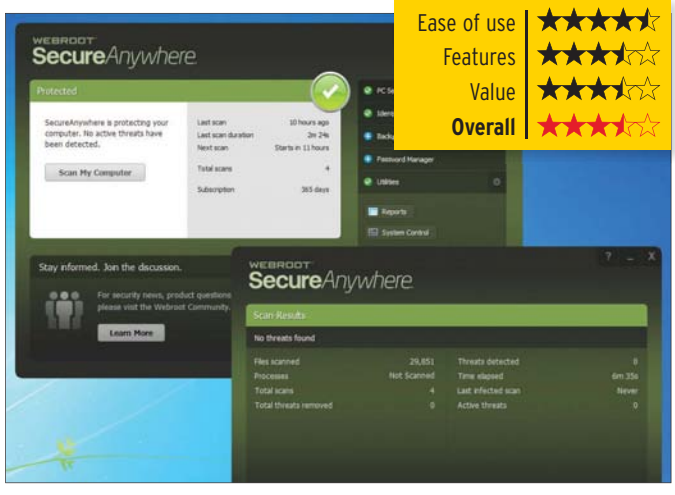
In the usability category, the program also scored a perfect 6.0/6.0, with just three false detections of legitimate software during scans, against the group average of nine. It didn't produce any false warnings when visiting websites, nor when using valid applications.

In the final category, performance, which measures the load of the application and any slowdown undertaking everyday tasks, the program showed a hit of just one second.

With such a good performance and the lower asking price, Trend Internet Security 2015 represents very good value, even though it misses out on certain extras offered by some of its competition.

WEBROOT INTERNET SECURITY PLUS 2015

£50 inc VAT (three-PC licence) • webroot.com



Webroot offers cloud-based real-time threat detection, through what it claims is a core AV engine with a particularly light PC footprint. Internet Security Plus 2015, which sits under the general banner of SecureAnywhere, is a multiplatform offering and you can use it on any combination of devices, up to the number of licences you buy.

The suite offers threat protection, anti-phishing, password protection, two-way firewall and identity protection. It misses out on a few extras, with no backup or online storage provision, though 25GB is available in the top-of-the-range Internet Security Complete product. There's also no parental control nor PC tune-up, though the software does provide a sandbox for evaluating new software before setting it free on your system.

Webroot doesn't provide samples to test sites such as AV-Test and AV Comparatives. Although these are the two main IS evaluation organisations, the company argues against them on two fronts.

First, it claims the samples used have an inbuilt bias. Test sites draw their malware samples from the suppliers of the security software on which they're tested. There is therefore a potential for bias in the samples, although given the number of internet security software providers – two dozen in the case of AV-Test – a single supplier would have to contribute a huge number of samples, unique to its own lab, for any effective bias to show. Anyway, don't you want your program to handle threats from whatever source?

Webroot's second argument is that the test sites concentrate on how well the software blocks malware and don't give enough weight to mitigating an attack, should the malware get through.

In other words, how does an internet security suite handle damaging code if it does get onto your system? Does it prevent it getting at important subsystems, such as the registry and browser software? Does it stop it from reproducing? This is a more valid argument, though most people will want the bulk of any security company's R&D focused on detecting and preventing initial infection.

In our own tests, Webroot Internet Security Plus 2015 completed a scan of our 50GB file basket in just seven minutes, though it only looked at 28,851 files. A repeat scan examined exactly the same number, but took 25 seconds less. The scan rate is good at 71 files/s.

Scanning puts only light load on a system, with a 28 percent increase in copy time with a scan running in the background. We have no test results to compare Webroot's AV efficacy with the others, but the company's claim to scan fast and leave a light impression looks fair.

Conclusion

By use of the cloud and by amalgamating results from their customers, the leading suppliers can add protection to threats within minutes of the first reports. Even if a malware gets to your PC, most suites will restrict access to its key components.

In this group, two products stand out. Trend Internet Security 2015 does the double of best performance in the group with the lowest cost of any reviewed product. While it has a couple of inconsistencies in its interface, it's a very good choice for a tight budget.

Norton Security offers an outstanding 10-device licence, which you can mix and match to fit your various desktops, laptops, tablets and phones. It's also the only product here to offer backup and online storage as part of its security brief.

	AVIRA £51 inc VAT ★★★★☆	ESET £50 inc VAT ★★★½☆	G DATA £45 inc VAT ★★★★☆
Version	Internet Security Suite 2015	Smart Security 8	Internet Security Suite 2015
Licence cover	3 PCs	3 PCs	3 PCs
System requirements	Windows XP SP3 32-bit/Vista SP2/7 SP1/8 all 32/64 bit; 1GHz CPU; 1GB memory; 150MB HD	Windows XP SP3 32-bit/Vista SP 2/7/8 all 32/64 bit; 32/64 bit CPU; 1GB memory; 320MB HD	Windows XP SP2 32-bit/Vista/7/8 all 32/64 bit; 1GB memory
Antivirus	Yes	Yes	Yes
Anti-malware	Yes	Yes	Yes
Anti-spam	Yes	Yes	Yes
Browser protection	Yes	Yes	Yes (includes BankGuard)
Firewall	Yes	Yes	Yes
Parental control	No	Yes	Yes
Online storage	No	No	No
PC tune-up	No	No	No
Non-PC support	Android and Mac OS X available separately	Android and Mac OS X available separately	Android and Mac OS X available separately
Extras	Social media protections	Botnet security; anti-theft (for laptops); social media protection	Twin AV engines with CloseGap technology; start-up manager

	SYMANTEC £60 inc VAT ★★★★½ PC ADVISOR RECOMMENDED	TREND MICRO £42 inc VAT ★★★★☆	WEBROOT £50 inc VAT ★★★½☆
Version	Norton Security With Backup	Internet Security 2015	Internet Security Plus 2015
Licence cover	10 devices	3 PCs	3 devices
System requirements	Windows XP SP3 Vista 32 bit SP1/7 SP1/8 32/64 bit; 800MHz CPU; 1GB (32-bit)/2GB (64-bit) memory; 700MB HD	Windows XP SP3/Vista SP2 32 bit, 7 SP1/8 32/64 bit; 1GHz CPU; 2GB memory (256MB XP); 1.5GB HD	Windows XP SP2 32-bit/Vista SP1/7 SP1/8 all 32/64 bit; Celeron or equivalent CPU; 128MB memory; 10MB HD
Antivirus	Yes	Yes	Yes
Anti-malware	Yes	Yes	Yes
Anti-spam	Yes	Yes	Yes
Browser protection	Yes	Yes	Yes
Firewall	Yes	Booster only	Yes
Parental control	No	Yes	No
Online storage	25GB included for PCs	No	No
PC tune-up	Yes	No	No
Non-PC support	Android and Mac OS X available separately	Android and Mac OS X available separately	Android and Mac OS X support included
Extras	Files backed up to secure storage from one PC can be recovered to another startup manager	Password manager; social media protection; file shredder	Sandbox for new application evaluation; password manager

BUDGET GRAPHICS CARDS

Spectacular performance with superb detail may not be on offer, but, as Robin Morris discovered when he tested seven sub-£100 cards, decent-enough game-playing speed, framerate and resolution most certainly is

All gamers love high-end graphics cards in the same way that car enthusiasts lust after a Ferrari or Lamborghini. Their gaming performance is astounding, and the visuals are packed with lavish detail and luscious colour. Unfortunately, just as supercars are beyond the reach of most, not everyone can afford the latest flagship graphics card. And can you really justify spending £300 or even £600 on a graphics card? You could buy an Xbox One or PS4 with that kind of cash.

So with that in mind, we've hand-picked seven of the best AMD and nVidia cards available at three affordable price points: £45, £65 and £90. In this test, we'll find out just how much money you need to spend if you're looking at gaming on a shoestring budget. Are any of them really good enough for decent shoot-em-up performance? Read on, and we'll show you what's hot, and what's not.



Build	★★★☆☆
Features	★★★☆☆
Performance	★★½☆☆
Value	★★★☆☆
Overall	★★★☆☆

SAPPHIRE RADEON R7 240 BOOST

£45 inc VAT • sapphiretech.com

The Radeon R7 240 GPU, seen here in this overclocked Sapphire edition, is far more straightforward than the 730. There are 64-bit versions of the R7 240, but a 128-bit bus is overwhelmingly the most popular and widely available. This particular R7 240 is kitted out with 2GB of GDDR3 RAM – more than ample for a card at this price-point. However, GDDR3 is a rather limited form of DDR RAM in comparison with GDDR5.

Whereas GDDR5 can effectively quadruple the basic speed of the memory, GDDR3 has no more than a doubling effect. Both the Sapphire Radeon and the 128-bit MSI GT 730 have a standard memory clock speed of 900MHz, which is then doubled by the GDDR3 to produce an 'effective' figure of 1800MHz. The resulting memory bandwidth of 28.8Gb/s suggests that the card will struggle to juggle a great deal of data simultaneously. This product will clearly fare better than its 64-bit versions, but you're not going to get high-end gaming from any card at this price point.

The Radeon R7 240 offers a very respectable core clock speed of 780MHz. This places it some 80MHz ahead of MSI's 128-bit GT 730, although it'll have an inferior figure to typical 64-bit versions – the Palit GT 730, for instance, comes with a core clock of 902MHz. However, where the R7 240 excels is with the sheer number of texture units, its complement of 20 pushing it ahead of the 16 of the GT 730. The number of these units is crucial when it comes to texture fill rates, and the Radeon R7 240's rate of 15.6GT/s is very much superior to the MSI GT 730's 11.2GT/s. Even the Palit GT 730, with its high core clock, trails the Radeon by 1.2GT/s.

With 320 stream processors, the Radeon has 64 fewer than the 730 GT. AMD architecture tends to lead to more rather than fewer stream processors, so this is a surprise. Otherwise, though, the cards are rather similar. The R7 240 has three ports – one each of DVI, HDMI and VGA – and doesn't require an extra connector from the PSU. It's marginally lower on power than the 730, although there was rarely more than 5W behind the cards during testing. It's a very discreet card too, with little fan or cooling noise.

VERDICT: The R7 240 is marginally inferior to the MSI GT 730 on game framerates, but it's very close, with the lead generally exceeding 2.2fps or so. Like the GT 730, though, the R7 240 will struggle at resolutions of 1680x1050 and above. For any kind of gaming, you probably need to set your card sights higher than the R7 240.



Build	★★★☆☆
Features	★★★☆☆
Performance	★★½☆☆
Value	★★★½☆
Overall	★★★½☆

MSI GEFORCE GT 730 2048MB

£48 inc VAT • uk.msi.com

The MSI GeForce GT 730 may be cheap, but it's not terribly simple as the 730 GT chip comes in multiple 'flavours'. Do you go for one with 1GB, 2GB or 4GB of memory? And a 64- or 128-bit bus but perhaps inferior clock rates? When it comes to memory configurations, we certainly wouldn't recommend 4GB: the price of the memory pushes it well beyond £60, so you'll almost certainly fare better with a proper £65 product, like the Radeon R7 250X. However, 1GB versus 2GB is trickier. Most of the time, you won't be making much use of the extra RAM, but for the little extra it costs, we'd recommend the 2GB version.

Of far more importance will be the memory bus and core clock speed. Most GT 730s now come with a 64-bit memory interface regardless of whether there's 1GB or 2GB onboard. Here we're covering the MSI GeForce GT 730 2048MB – not as easy to find as one with a 64-bit memory bus, but it'll produce superior performance for a little extra.

The 128-bit MSI GT 730 has a standard memory clock speed of 900MHz, doubled by the GDDR3 to an 'effective' figure of 1800MHz. You can find 64-bit bus versions with higher figures, but these will be hampered by their narrow buses. This MSI card produces a memory bandwidth figure of 28.8Gb/s – double the 14.4Gb/s rate of a 64-bit bus. In our opinion, a 128-bit bus is a must-have.

The GT 730 struggles on texture handling as the 128-bit version sacrifices some core speed for the wider bus. The card struggles on fill rates, with its 11.2GT/s well behind the 14.4GT/s of a typical 64-bit 730, and a long way behind the Radeon R7 240's 15.6GT/s.

The GT 730 has 384 stream processors to the Radeon R7 240's 320 but is otherwise fairly standard. It has a DVI, HDMI and VGA port, and no extra connectors are required from the PSU. It consumes a little more power than the R7 240, but rarely more than around 5W. At this level of performance, you're not likely to need much power. It's not as quiet as some cards but still makes little noise.

VERDICT: The MSI GT 730 is clearly the best of the sub-£48 cards here, and fairly consistently beats the R7 240 in game testing. However, the lead – rarely more than 2.2fps – is minor. The bigger question is whether you should buy any card at this low price point. Even at a resolution of 1680x1050, the GT 730 only just breaks the 30fps mark. It is the best for the money, and you can, at a pinch, play decent games on it. But our advice would still be to save up and look to the £65+ products instead.



Build	★★★★☆
Features	★★★½☆
Performance	★★★☆☆
Value	★★★★☆
Overall	★★★½☆

ASUS GEFORCE GT 740 OC

£65 inc VAT • uk.asus.com

The £65 Asus GeForce GT 740 OC pushes the hardware ceiling that bit higher than the likes of the Radeon R7 240 and GeForce GT 730, also reviewed here. Its impressive memory subsystem ditches GDDR3 RAM in favour of ultra-fast GDDR5.

Whereas the cheaper products are stuck on memory clocks of 800- to 900MHz, the GT 740 hits the heady heights of 1250MHz. And because GDDR5 is better than GDDR3 at extending clock capability, the effective difference is even more stunning, with the 5GHz figure finishing a good way ahead of the 1.6- to 1.8GHz of the cheaper cards. The memory bus itself remains at 128-bit, but there's still a gulf in performance when you compare the GT 740's memory bandwidth to that of the R7 240 and GT 730 – a massive 80Gb/s compared with 28.8Gb/s at best. This is also enough to place it ahead of the similarly priced Radeon R7 250X with its 72Gb/s.

The GT 740 also fares well in terms of texture handling. Its 32 texture units again give it a significant advantage over the 16 to 20 of the R7 240 and GT 730. However, while its texture fill rate of 33.1GT/s is a big improvement on the 11.2- to 15.6GT/s of the cheaper cards, the GT 740 still fades compared with the Radeon R7 250X. The 250X has a lower core clock speed, but more than makes up the ground with an extra eight texture units, giving it a fill rate of 38GT/s.

The GT 740 also falls behind its rival on stream processors – with 384 to its rival's 640. In all honesty, this difference is less dramatic than it might seem. The AMD architecture has produced rather more stream processors than the nVidia equivalent. This has often not translated into superior performance. The GT 740 only has DVI and HDMI outputs – some cards will have DisplayPort as well. A single 6-pin connector is required from the PSU, although the GT 740 is relatively light on power – offering a TDP of 60W against the 250X's 95. The GT 740 is very much the most efficient and power-conservative card at this price point.

VERDICT: The GT 740 OC is a very nice card, and a significant step up on the £45+ cards. Always above the 30fps mark at 1680x1050, it offers good framerates as long as you don't seek the very best detail and texturing. However, the 250X is simply faster, generally pulling out an extra 4- to 5fps on every game. The GT 740 scores well on power consumption, though, and if you're looking to create a decent gaming PC that doesn't produce much wattage, then this is a beautifully discreet option.



PC ADVISOR BEST BUY

Build	★★★★☆
Features	★★★½☆
Performance	★★★½☆
Value	★★★★☆
Overall	★★★★½

SAPPHIRE RADEON R7 250X

£65 inc VAT • sapphiretech.com

£65 may not be enough to get you a top performer, but it's enough to get a product that isn't ferociously cutting every corner in sight. A product like the Sapphire Radeon R7 250X offers a bounty of primped and primed specs, effortlessly batting away even the similarly priced Asus GeForce GT 740 OC. As with the 740, the RAM is GDDR5, so it can make the most of some enhanced clock speeds. However, the R7 250X doesn't match the soaring clocks of the 740 OC: its memory speed tops out at 1125MHz, some 125MHz down on the 740 OC. Take into account the quadrupling capabilities of GDDR5, and the 250X has an effective rate of 4.5GHz – half a gigahertz down on the 740 OC's 5GHz. That gives the R7 250X a slightly inferior memory bandwidth of 72Gb/s – eight down on the 80Gb/s of the 740.

Both the 740 OC and R7 250X have the same 128-bit bus and the same meagre 1GB of memory. The extent to which you'd make use of the extra 1GB at this level of gaming is debatable, but if there's one aspect of these cards we'd like to hike, it's the RAM.

These £65 cards can also deliver more textures. The R7 250X lost out to the 740 on memory clocks, and it also trails on core clocks – 950MHz in reply to the 740's healthy 1033MHz. But here, at least, the R7 250X can fight back because it has 40 texture units rather than the 32 of the 740. The superior quantity of texture units means the 250X overtakes its rival for overall texture fill rate, scoring 38GT/s against the 740 OC's 33.1GT/s. The £45 models produce paltry figures between 11.2GT/s and 15.6GT/s.

The 250X strikes another victory on stream processors, its 640 far outnumbering the 384 of the GT 740 OC. The two cards are rather more equal in terms of ports and connectors, although the 250X's DisplayPort outlet gives it more versatility. The 250X does put out considerably more power, with a TDP of 95W against the 740 OC's 60W. If power output is a concern, the 740 will be a slightly better choice.

VERDICT: The R7 250X is a breath of fresh air compared to the cheap £45+ products. At a resolution of 1680x1050, it can effortlessly shatter the 30fps mark. Crucially, it's never far away from the 50fps mark. If you're getting close to 50fps, you should be having a very comfortable playing experience. The 250X is the fastest card at this price point, thanks mainly to its superior texture handling, and generally finishes ahead of the GT 740 by around 4- to 5fps. Pound for pound, it offers the best value in the test.



Build	★★★★☆
Features	★★★½☆
Performance	★★★½☆
Value	★★★½☆
Overall	★★★½☆

EVGA GEFORCE GTX 750 SUPERCLOCK

£90 inc VAT • evga.com

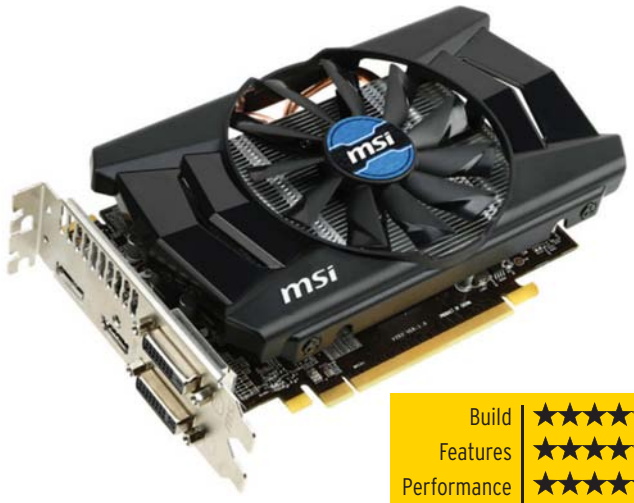
The EVGA GeForce GTX 750 SuperClock is based around nVidia's GeForce GTX 750, a chip released in early 2014. The 750 marked a radical shift for nVidia. Gone was the desire to pump the most pixels out of the silicon. Instead, its chip aimed to produce similar performance to previous-generation products with much less power. In truth, this makes for an underwhelming product, since lower energy consumption, while laudable, is hardly calculated to thrill.

That explains the rather disappointing specs of this card. Whereas the GeForce GT 740 OC offers effective memory clocks of 4.5- to 5GHz, the GTX 750 OverClock can only push up to 5.012GHz – and the similarly priced but more conventional Radeon R7 260X hits 6GHz. Neither has the 128-bit memory bus been improved on, and the GTX 750 scores a memory bandwidth of 80.2Gb/s – only marginally ahead of the GT 740's 80Gb/s, despite the latter costing around £20 less, and a good distance behind the 260X's 96Gb/s.

While the GTX 750's stellar core clock speed of 1294MHz towers over the R7 260X's 1050MHz, and casts an even longer shadow over the 950-1033MHz of the £65 cards, the number of texture units makes more difference. And here the 750 loses miserably, with just 32 in response to the R7 260X's 56. The 750, then, delivers a texture fill rate of 41.4GT/s, a slight improvement on the 38GT/s produced by the cheaper Radeon R7 250X. And the Radeon R7 260X wins handsomely, with a texture fill rate of 58.8GT/s.

The GTX 750 loses out on stream processors too, with just 512 against the 260X's 896. But if it is indeed power that drives you on, you'll relish the 750. So conservative is it, it doesn't even require additional power from the PSU – the 260X requires an extra 6-pin connector. And the 750's TDP of 60W is almost half that of the 260X OC's 115W. Indeed, of all the cards here, only the two cheapest have lower TDPs. In the real world, the gap isn't as big, but we regularly detected drops of more than 45W between the 750 and the 260X. The 750 is quieter as well.

VERDICT: The GTX 750 trails behind the 260X. The difference isn't as great as the specs hint, but there is a clear 3- to 4fps gap across most games. Pure gamers, then, will shy away from the 750. But if you're looking to build a system where power needs to be tightly controlled, and you want as little pressure on the PSU as possible, the 750 has merit. It's certainly a revolutionary design, even if, in this case, that design is unlikely to make it a top choice.



Build	★★★★☆
Features	★★★★☆
Performance	★★★★☆
Value	★★★★☆
Overall	★★★★☆

PC ADVISOR
RECOMMENDED

MSI RADEON R7 260X OC

£90 inc VAT • uk.msi.com

A card like the MSI Radeon R7 260X amounts to just about the best you can buy for less than three figures. We're still not talking about graphical showcases of everything that's spectacular and sublime – a truly powerful card will set you back at least £300, while for the most glorious results you'll be looking at £500+. But it lets you sample the latest games at decent framerates – just as long as you're happy to do without a little detail or are satisfied to play at lesser resolutions.

While its main rival at this price point, the GTX 750 SuperClock, takes the unusual approach of sacrificing speed and specs for lower power consumption, the Radeon R7 260X makes a more conventional grab for framerates – even if it is little more than a slightly enhanced version of that old faithful, the HD 7790. The 260X perhaps starts slowly, and its memory clock speed, an effective 6GHz, is a solid but not sensational improvement on the 5GHz of the GeForce GT 740 OC. In fairness, the 260X's memory bandwidth of 96Gb/s is a good distance on from the GT 740's 80Gb/s; even the 260X's big rival, the GTX 750, manages only 80.2Gb/s.

The 260X's core clock speed is less than stellar, with its figure of 1050MHz trailing far behind the GTX 750's 1294MHz, and only just staying ahead of the GT 740's 1033MHz. However, we've seen before that clock speeds are trivial compared to the number of texture units, and here the 260X strikes decisively, pulling out a complement of 56, some 24 ahead of the 750 and GT 740 OC. That helps the 260X to an emphatic texture fill rate of 58.8GT/s – blitzing the 41.4GT/s of even the 750.

The 260X also fares much better on stream processors, offering 896 of them to the 750's 512. However, the 260X is undoubtedly power-hungry compared to the 750's clever design. The 260X needs an extra 6-pin connector from the PSU. It also puts out considerably more power – its TDP of 115W is almost twice that of the 750's 60W. The difference isn't that large in real life, but there's a good 45W between them most of the time. And the 260X is a louder card to boot.

VERDICT: The 260X is the superior card for gamers – even if the difference isn't as big as you might think. We were mostly seeing average increases of 3- to 4fps. The most we saw – in Crysis 3 – was a gap of almost 7fps. But if you need strong gaming performance for less than £100, this is the best product here, and can handle games even at the relatively high resolution of 1920x1200.

Conclusion

Shopping for a graphics card for under £100 can be something of a shark-pit. What you're not going to get is spectacular firepower that can whistle through all of the latest games at top resolutions. However, there are signs that, if you're prepared to settle for a little less than top settings, you can game even on a shoestring double-digit budget.

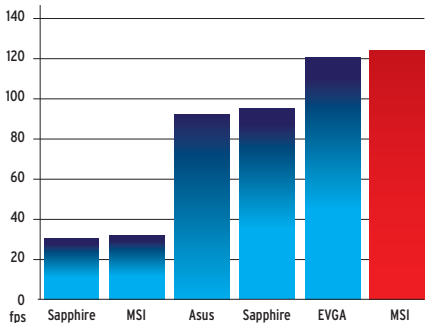
There is a limit, though, and it's difficult to recommend any of the cards near the bottom of the market. Less than £50 simply isn't enough to do justice to today's visual extravaganzas. However, if you're happy gameplaying with modest detail settings and a display resolution of 1680x1050, then there are some good choices available right now. The Sapphire Radeon R7 250X, in particular, is an excellent graphics card that offers highly playable framerates, while costing well under £100.

At the higher-end of the sub-£100 market, the MSI Radeon R7 260X OC is another jump forwards again, allowing framerates of 50+ in situations where even the 250X manages just over 30. It's also worth remembering that framerates aren't everything.

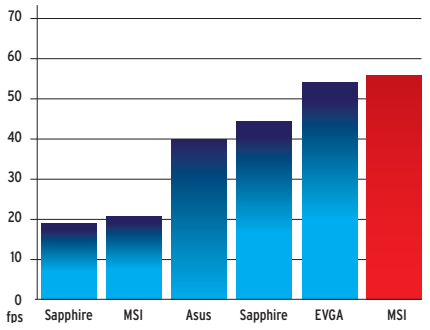
The GeForce GTX 750 SuperClock is a fascinating experiment that won't perhaps offer the high framerates most customers need. However, its power consumption is exceptional, allowing it to be built into systems designed to consume little wattage. It's really more of a demonstration of how much extra can be squeezed from existing hardware, but the power-conscious will relish its modest needs.

	SAPPHIRE £45 inc VAT	MSI £48 inc VAT	ASUS £65 inc VAT	
Model name	Radeon R7 240 Boost	GeForce GT 730 2048MB	GeForce GT 740 OC	
Memory	2GB GDDR3	2GB GDDR3	1GB GDDR5	
Chip	AMD Radeon R7 240	nVidia GeForce GT 730	nVidia GeForce GT 740	
Manufacturing process	28nm	28nm	28nm	
Max core clock	780MHz	700MHz	1033MHz	
Standard memory clock (DDR effective)	900MHz (1800MHz)	900Hz (1800MHz)	1.25GHz (5GHz)	
Memory bus	128-bit	128-bit	128-bit	
Memory bandwidth	28.8Gb/s	28.8Gb/s	80Gb/s	
Stream processors	320	384	384	
Texture units	20	16	32	
ROPs	8	8	16	
Texture fillrate	15.6GT/s	11.2GT/s	33.1GT/s	
Outputs	1x DVI, 1x HDMI, 1x VGA	1x DVI, 1x HDMI, 1x VGA	1x DVI, 1x HDMI, 1x VGA	
Power connector required	None	None	1x 6-pin	
TDP	30W	38W	6W	
Warranty	2 years	3 years	3 years	
FRAMERATES				
Bioshock Infinite Rage (1680x1050)	23.2	25.1	45.8	
Bioshock Infinite Rage (1900x1200)	18.3	20.6	39.8	
Metro Last Light (1680x1050)	34.2	36.3	65.3	
Metro Last Light (1920x1200)	15.8	17	23.8	
Stalker (1680x1050)	29.7	32.6	92.1	
Stalker (1920x1200)	24	26.1	34	
Crysis 3 (1680x1050)	29	32.1	49.7	
Crysis 3 (1920x1200)	19.8	22.7	44.3	

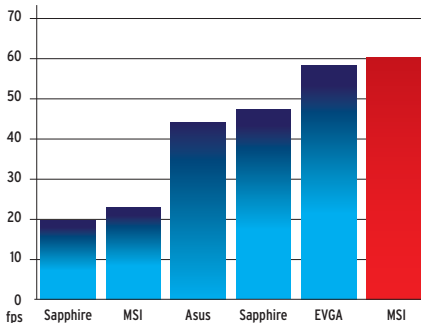
Stalker (1680x1050)



Bioshock Infinite Rage (1900x1200)



Crysis 3 (1920x1200)



SAPPHIRE £65 inc VAT ★★★★½ PC ADVISOR BEST BUY	**EVGA** £90 inc VAT ★★★½☆	**MSI** £90 inc VAT ★★★★☆ PC ADVISOR RECOMMENDED
Radeon R7 250X	GeForce GTX 750 SuperClock	Radeon R7 260X OC
1GB GDDR5	1GB GDDR5	2GB GDDR5
AMD Radeon R7 250X	nVidia GeForce GTX 750	AMD Radeon R7 260X
28nm	28nm	28nm
950MHz	1294MHz	1050MHz
1125MHz (4500MHz)	1253MHz (5012MHz)	1.5GHz (6GHz)
128-bit	128-bit	128-bit
72Gb/s	80.2Gb/s	96Gb/s
640	512	896
40	32	56
16	16	16
38GT/s	41.4GT/s	58.8GT/s
1x DVI, 1x HDMI, 1x DisplayPort	1x DVI, 1x HDMI, 1x DisplayPort	2x DVI, 1x HDMI, 1x DisplayPort
1x 6-pin	None	1x 6-pin
95W	60W	115W
2 years	3 years	3 years
51.9	63.4	71.9
43.7	54.8	56.3
69.8	84	86.3
24.6	34.1	36.7
96.4	120.3	123.9
35.4	46.4	50.1
54	69.4	76.3
47.4	58.4	60.1

SURF THE WEB

THE BEST WINDOWS BROWSERS

You want to know that your web browser is fast and secure – and has a few extra features to make the online experience easier. Martyn Casserly tests six different browsers to find which is best for Windows



IN STYLE



At its recent Windows 10 launch event, Microsoft announced a new browser, codenamed 'Spartan', which is set to appear when the new operating system is released at the end of this year. This slimline internet portal will feature a modern, minimalistic design, lean performance, the Cortana digital assistant built-in, and the ability to run extensions. All the early signs are promising, but that's in the future. Right now, what's the deal with browsers for your current version of Windows?

The choice is a lot broader than you might think, with plenty of offerings vying for your surfing pleasure. Some well-known names, such Google with its Chrome browser and Microsoft with the ubiquitous Internet Explorer, dominate the landscape, but old favourites such as Firefox still have plenty to offer in terms of added features and data security.

Here we've gathered together six of the best browsers currently available for Windows, and put them through their paces to see how well they deal with the rigours of the modern internet. We looked at speed, user interface, added features and security to find the ultimate application to handle your web needs.

The best part about these six browsers is that they are all free, and you can, of course, use more than one at a time on your PC. This could prove useful for using online banking or data sensitive sites, as you can disable features like JavaScript or Flash on one browser and reserve it solely for these activities. With so much of modern computing being based online, it's always good to know that you don't have to stick with the browser that came on your computer, and some of the alternatives are very good indeed.

AVANT

★★☆☆☆

avantbrowser.com

Outside the big hitters in the browser space (Chrome, Internet Explorer, Firefox and Opera), there are a surprising number of smaller, independent offerings that cater for more specific tastes. Avant is one such creation, which boasts a few innovative technologies under the hood. Typically a browser will use a specific rendering engine to display web pages. Chrome and Opera use Blink (a Google fork of Webkit), Firefox has Gecko, while Internet Explorer, at least until Spartan arrives, employs Trident. Avant is unique in that it offers all three. The idea behind this rather nifty coding feat is that you can avoid issues with sites performing badly on any given engine by simply swapping to another. In principle this is fine, but browsers have now matured and can usually cope with most things the internet throws at them. Sure, you'll always find a few that are optimised for Internet Explorer 6 (thanks, governments of the world), but these are disappearing at a steady rate. Nevertheless, Avant does give you the ability to overcome these difficulties, although we'd probably just have Explorer installed and ready to launch rather than fiddle with the rendering engine options here.

Avant is not that much fun to use. While it's a capable web browser in its own right, it feels heavily outdated, both in the user interface and extended functions you find on modern alternatives. Launch Avant and you'll see a simple address/search bar and accompanying separate search box design, with tabs displayed above. To the left of the search bar, though, are a series of cartoonish icons which feel jumbled and from another style era. To find the menu options you click on a grid of dots in the top right corner, which drops a crowded, icon-heavy tray. From here you can



launch private browsing, organise the layout of your windows, access Google Translate, and set up a few features. It's perfectly fine, but lacks a sense of polish.

One feature that's seems interesting initially is the built-in ad blocker, but in use it kept popping up a box to report the things it had blocked (which in practice was more intrusive than the ads themselves) and indeed was pretty poor at cleaning up any pages we visited, with most banner and framing ads still being displayed. There were also issues with pages not loading, and the odd freeze, which was disappointing as Avant highlights the browser's memory management capabilities.

VERDICT: As an alternative to Internet Explorer we'd find this one hard to recommend over the original.

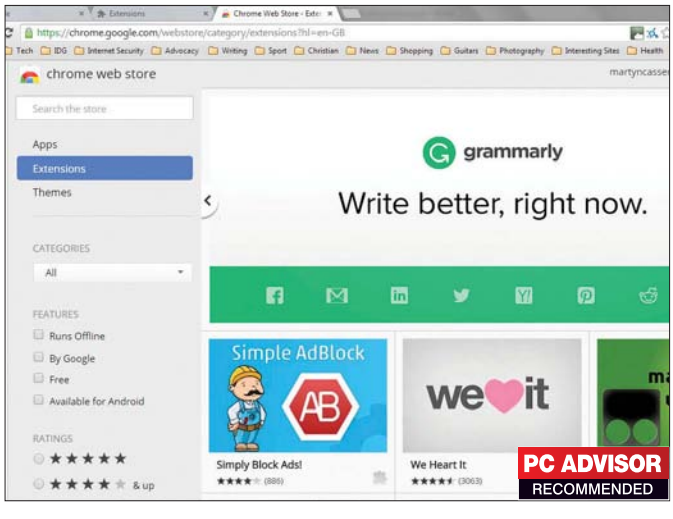
CHROME

★★★★½

google.co.uk

Google has been slowly improving its Chrome browser over the years, so that today it's more of an entire ecosystem than a simple web portal. For some this has been a step away from the simple, lightning-fast browser that appeared back in 2008, but if you buy into the Google universe then it has some compelling features. To really get the most out of Chrome you'll need a Google account – it's free and take seconds to create. With this you can sync your favourites, open tabs, history and stored passwords with any other machine running the browser – very handy indeed. The passwords themselves are encrypted by Google, but you can also enable all your synced data for encryption by selecting the option in Settings, then creating a passcode known only to you.

Chrome has a clean layout, with a universal search/address bar at the top, and any open tabs just above. The three lines in the upper right corner give you access to settings for organising your bookmarks, entering private browsing mode or increasing the size of the content in the main panel. The More Tools section also gives you access to the Chrome web store where you can install an enticingly wide range of plug-ins, extensions and themes. There are extensions for apps such as Evernote, Pocket, Wunderlist, Pinterest and Gmail, as well as ad blockers, reader modes, HTTPS everywhere, and Chromecast (which lets you mirror your screen on a TV if it has a Chromecast HDMI stick attached). Chrome also has its own apps in the store, including such productivity enhancers as Google Docs, Hangouts and Drive, alongside additional calendars, games, and office tools. With Chromebooks increasingly popular, this ecosystem



looks set to continue expanding, accompanied by extra functionality. Chrome has an impressive voice search feature, where saying the words 'OK, Google' on the homepage will immediately enable you to dictate your search terms. The recognition is very good, with complex sentences transcribed accurately, and Chrome will even read aloud the answers to some questions.

In our benchmark tests (see table at the end of this feature), Chrome consistently came top, which proves you can have plenty of useful features plus performance. No wonder it's so popular.

VERDICT: Chrome continues to mature into an excellent modern browser. With its wealth of apps and features matched by speed and tidy design, it looks set to be the benchmark for a while to come.

DOOBLE

★★★☆☆

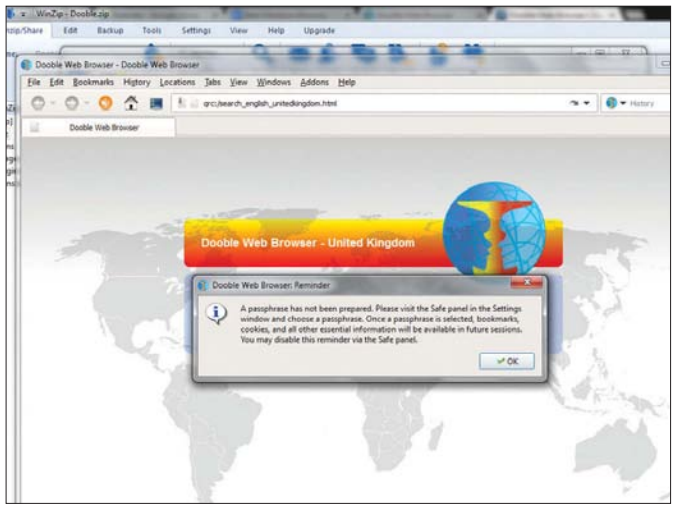
dooble.sourceforge.net

The name might not exactly roll off the tongue but the Dooble browser is one well worth remembering. It doesn't boast the flashiest interface, or indeed the fastest performance, but if security and privacy are things that you take seriously then this indie browser will be of great interest.

The signs of just how important these features are to Dooble are evident from the first time you launch the program. While most modern browsers offer a private or incognito mode, Dooble is set that way by default. So much so that if you want the browser to remember anything at all from your time online, you need to create a master password, otherwise everything is wiped clean when you exit the program.

Roaming the web is also a stranger experience, as Dooble has Flash and JavaScript disabled by default. This means that there are no ads, and a pretty lean supply of media content on sites where you might expect them to be. Now this could seem like heaven to some, but it can make the internet a pretty dull place at times. It's also not that helpful in telling you why YouTube isn't working, or providing you with a link to download Flash for broken videos. Several pages took a few attempts to load as well, or were rendered in an odd way that made using them virtually impossible. The lack of documentation is also something of a problem, as advanced features like the FTP browser, file manager and even the temperamental search box need further explanation if you are going to get the best out of them.

Security and convenience have never been easy bedfellows, though, and for its intended use Dooble is a success. Navigation



is swift, the functionality (when you understand it) can be quite impressive, and the knowledge that you're safe from many of the worst hazards of the web is a comforting thought.

You wouldn't really want to use it as your daily driver, though, unless you were desperately trying to avoid detection. The compromises made in terms of safety really do have a dramatic effect on the quality of content available online, and even basic website functionality can be a challenge at times. When partnered with a more fully featured browser on the machine, Dooble can be a very useful tool, but by itself it's just too much effort.

VERDICT: The safety-first approach is commendable, but the version of the web that you're able to access as a result is going to be too hampered for most users.

FIREFOX

★★★★☆

mozilla.org

Firefox was probably the first alternative browser many people ever installed. Launched originally in 2004, the open source offering has been a constant in the browser firmament, and is currently ranked globally as the third most popular, behind Explorer and Chrome. One of its strengths is the amount of customisable options it makes available to users. While other browsers offer the ability to change default search engines, Firefox has a much wider range of alternatives available, including Bing, Google, DuckDuckGo, YouTube, Amazon, and a number of anonymous options. You can also install themes to change the look of the browser, or add a whole host of productivity and security features. These include ad blockers, download managers, web filters that block hard-core sites based on keywords you set up, Facebook ad and spam blockers, automation programs that can load up your favourite sites with one click, and, well, literally thousands more.

One that's particularly useful is the NoScript security suite, which allows Java and JavaScript to run only on sites you've approved personally. As these are the two most used areas of attack from malicious software, that's a big plus for security online.

Of course there's a trade-off with all that extra computational load, and that's if you install lots of extra features you're going to notice a dip in performance. Keep things moderately simple, though, and this current iteration is fast and robust. While it couldn't quite match the speeds of Chrome and Opera in our benchmark tests, it was never far behind those greyhound-like rivals. Firefox also has the standard security features you'd expect – private browsing,



encrypted password storage, phishing and malware site warnings – plus the optional Do Not Track, and more advanced tracking protection, to stop ad servers watching your browsing habits. There's also a few other interesting features built-in, including an RSS reader that lets you subscribe to your favourite sites and have the news stream in your bookmarks bar. Another smart feature is Hello – a Skype alternative that allows you to video call friends without either of you needing an account. Simply launch the feature, send an invite to the call, and you're good to go.

VERDICT: We've always had a soft spot for Firefox, but past versions have disappointed due to sluggish performance. The last few releases have shown big improvements, and this one is particularly impressive.

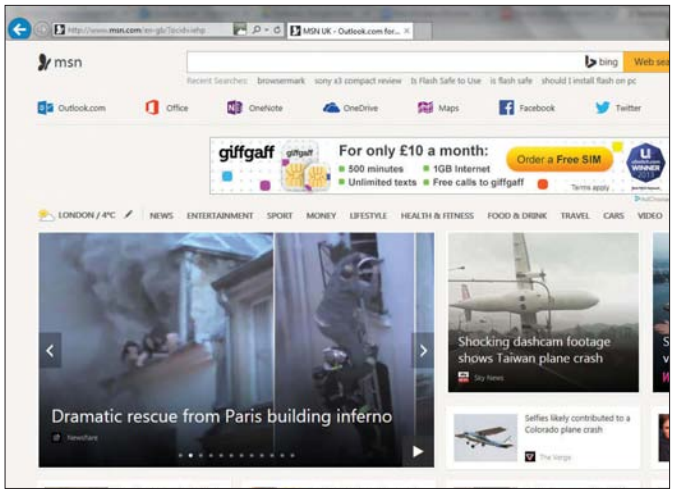
INTERNET EXPLORER ★★★★☆

microsoft.com/en-gb

Last year, Internet Explorer version 11 was crowned the most used PC browser in the world, taking over from the previous incumbent Explorer 8. However, a good deal of this dominance can be put down to the fact that Explorer is the default browser in current versions of Windows 7, 8 and 8.1. But it can't be all that bad if so many people rely on it every day, and the current iteration of Microsoft's long-standing platform is as polished as it's ever been.

When you launch it, a short search/URL bar appears at the top left of the screen, any open tab to the right, and little else in terms of menus. Web content gets the vast majority of the space, which is a welcome advance on the toolbar-heavy designs in the past. If you prefer a little more functionality, right-clicking on the top of the screen brings up a contextual menu where you can select which toolbars to display – favourites, menu, and so on. It's also easy to import bookmarks from other browsers – just click on the star icon then select the drop-down menu and click on the import options. The process is quick, so you can switch between browsers with little interruption to your work. You can also drag an open tab to the Windows taskbar where it will be pinned, just like a normal application, allowing you to go directly to your favourites without even launching Explorer. There are also several add-ons, such as Flash and Google Maps, but the ecosystem lacks some of the helpful additions available with Firefox and Chrome.

Privacy is a hot topic, and Explorer 11 has some useful built-in features to help you remain anonymous online. The private browsing mode (InPrivate) doesn't store web history or cookies, although you should remember that your ISP can still see where you're



going. There is also a Do Not Track feature enabled by default, and a more powerful tracking protection list to ensure that advertisers keep their hands off your data. Smartscreen is another security feature that analyses websites you visit in order to warn you if they feature malware or could be phishing for data. It's not a foolproof feature, but it is a handy addition.

While this stripped-down version of Explorer is solid and neat, it still lagged behind Chrome, Opera and Firefox in our benchmark tests, making it mid-level in terms of performance, but pleasant to use none the less.

VERDICT: With a few nips and tucks over previous versions, Internet Explorer is in fine fettle now with a clean design, robust performance, and ever-improving security features.

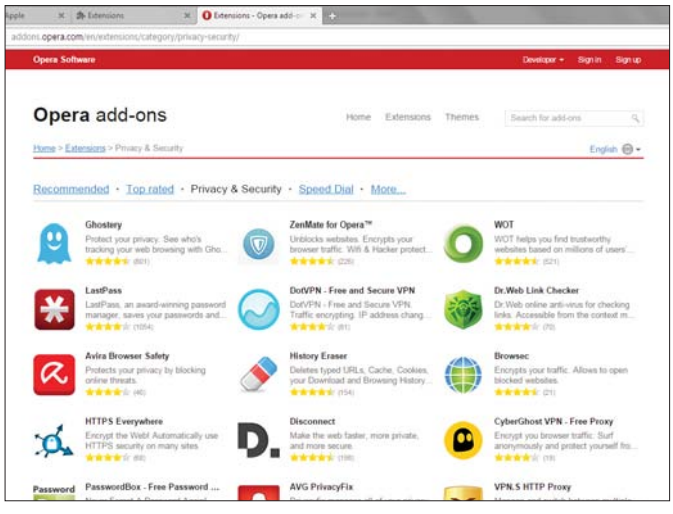
OPERA ★★★½☆

opera.com

Next year Opera will reach its 20th anniversary – just one year behind Internet Explorer. For such a veteran application, the current version looks very modern indeed. Some of this is down to the recent switch to the Blink engine, which powers Chrome, while the rest lies in a minimalist design that keeps Opera sleek and swift in equal measure.

Opening up the browser reveals a clean, sparse interface, with a solitary address/search bar at the top, open tabs above, and the Opera menu icon in the top left corner. Clicking this brings down a list of options including the few special features on offer. In truth many of Opera's innovations over the years have been adopted by other browsers, such as the speed-dial screen that lists your most often visited sites, but there are a few jewels left in the crown yet. Opera Turbo is an interesting idea designed to improve internet performance on a slow connection by passing the connection through the Opera servers where images and pages are compressed. This generally means faster loading times, and in practice we were quite happy with the results in comparison with standard mode. Images are understandably grainier, but pages loaded successfully and quickly even on patchy Wi-Fi hotspots.

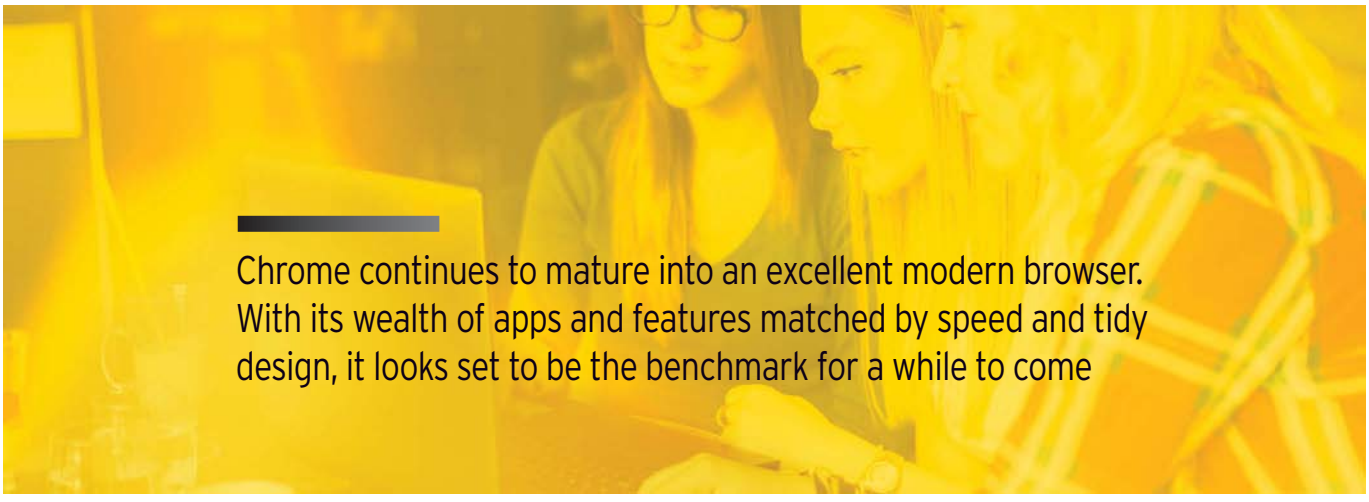
Bookmarks can be imported easily from other browsers, although we struggled to find an obvious way to then add them to the Bookmarks bar. One clever, and potentially very useful feature, is that you can actually share a bookmark folder with friends. Say you were planning a holiday or redecorating your home, and found several sites with ideas you liked; simply by clicking the Share button, you can send the entire folder to a



friend instead of putting loads of links in an email. Passwords for favourite sites are stored in an encrypted format on your hard disk, but if you want to use online banking and other sensitive sites Opera prompts you to create a master password. It also offers protection against malware and phishing.

Opera is quite customisable thanks to an extensions and themes store that features offerings from Evernote, Pocket and Amazon, among many others – including several useful security plug-ins.

VERDICT: Opera might feel a little like Chrome-lite these days, but that's no bad thing. It's fast, even on slow connections, thanks to its Turbo mode, and has plenty to offer those who prefer not to live entirely in the Google universe. ☒



Chrome continues to mature into an excellent modern browser. With its wealth of apps and features matched by speed and tidy design, it looks set to be the benchmark for a while to come

	AVANT ★★☆☆☆	CHROME ★★★★½	DOOBLE ★★★☆☆
Version	2015 (Build 7)	40	1.5
Download link	tinyurl.com/omper4w	tinyurl.com/7ax3dad	tinyurl.com/3etcsb
Features	Private browsing; password manager; extensions; Do Not Track; pop-up blocker; ad blocker; tri-core rendering engine; split view	Private browsing; password manager; extensions; Do Not Track; massive app ecosystem; data syncing with Google account; Chromecast ability; excellent voice search	Private browsing as standard; master password; password manager; Do Not Track; JavaScript and Flash disabled; HTTPS; file manager; FTP browser
Compatibility	Windows XP/Vista/7/8	Windows XP (32-bit)/Vista/7/8/8.1	Windows XP/Vista/7/8
Browsermark	1537	2958	N/A
Peacemaker	948	1906	N/A
HTML5 test	335/555	511/555	N/A

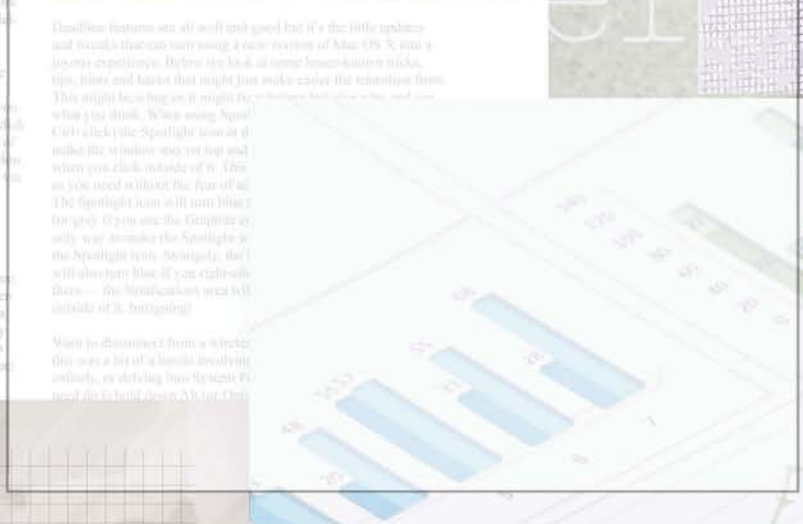
	FIREFOX ★★★★☆	INTERNET EXPLORER ★★★★☆	OPERA ★★★½☆
Version	35	11	27
Download link	tinyurl.com/pw7thp3	tinyurl.com/p3a9bew	tinyurl.com/oovzks5
Features	Private browsing; password manager; Do Not Track; massive extensions ecosystem; data syncing with Firefox account; advanced security plug-ins	Private browsing; password manager; extensions; pin favourites to Taskbar; Do Not Track; tracking protection list; smartscreen	Private browsing; password manager; Do Not Track; extensions ecosystem; data syncing with Opera account; advanced security plug-ins; turbo mode; bookmark sharing
Compatibility	Windows Server 2003 SP1/XP SP2/ Vista/7/8	Windows Phone/7/8/8.1	Windows Phone/XP/Vista/7/8/8.1
Browsermark	2002	1672	2527
Peacemaker	1797	948	1869
HTML5 test	449/555	336/555	507/555

Higher is better on Browsermark and Peacemaker scores

PDF

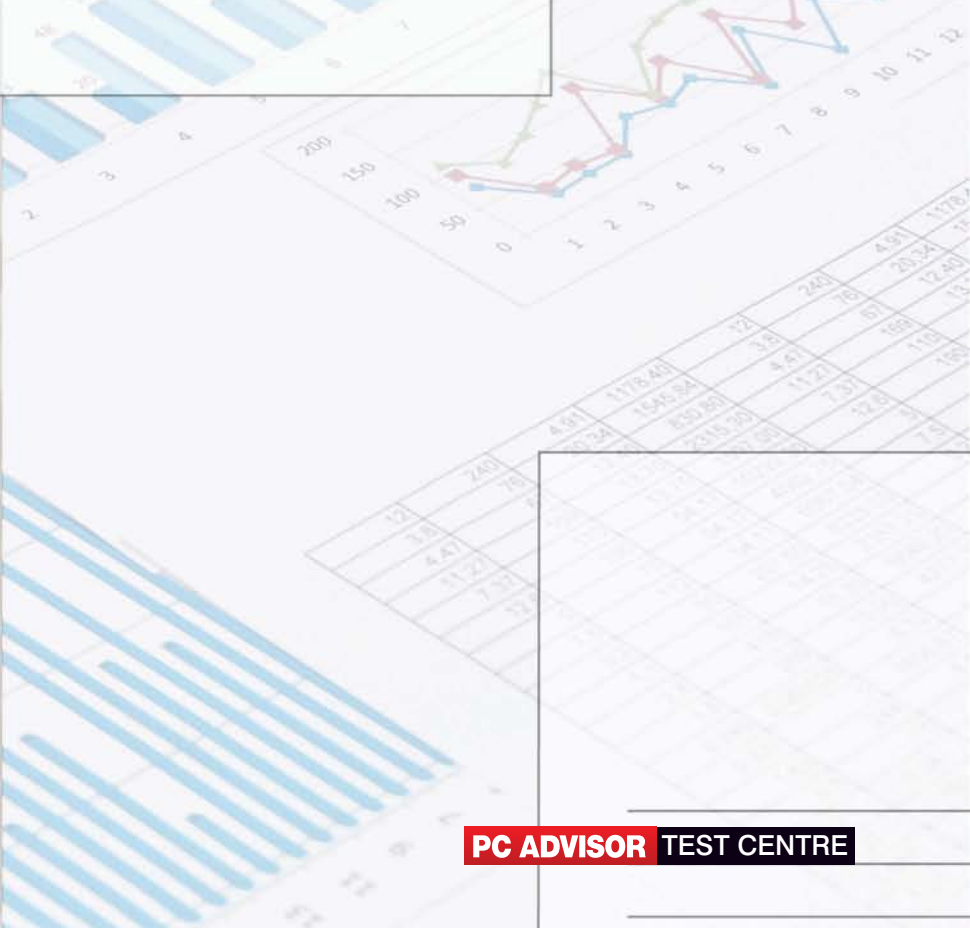












EDITORS

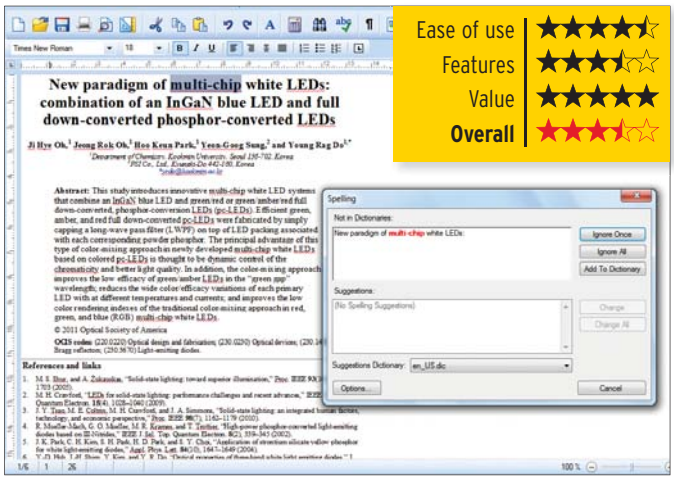
Whatever software you use to create a document, you can guarantee that every other PC user can read it by saving it as a PDF. A PDF editor will also let you edit PDFs produced by other people, work collaboratively on those files, and a whole lot more. Mike Bedford looks at one free and five commercial packages, including the big beast of the PDF world, Adobe Acrobat

The PDF (Portable Document Format) file type is rightly popular as a cross-platform means of exchanging documents easily. PDFs can be read on any type of system, irrespective of the operating system on the reading machine and the application software used to create the file that the PDF is an image of. So, for example, a document created using OpenOffice under Mac OS X can be read on a Windows PC without OpenOffice having to be installed on it.

We put six PDF editors through their paces and present our findings here. In addition to allowing you to create PDF documents, these packages let you edit your PDF files without the laborious process of editing the original source file in its native format and reconverting it to PDF. What's more, most of them also provide advanced features such as forms creation, digital signatures and ID certification, as well as collaborative review and commenting, that you generally don't get with free PDF packages. We also take a look at one free package to see just how much you can get without spending a penny.

ABLEWORD

Free • ableword.net



Although we're reviewing AbleWord here as a PDF editor since it provides a free alternative to the commercial PDF editors, some of which have a not insignificant price tag, this is not the way it is promoted. According to its developers, AbleWord is primarily a word processor, albeit one that can import and export PDFs as well as Microsoft Word and RTF files.

Since it's essentially a word processor, AbleWord doesn't have many of the advanced features present in PDF editors that attract a 'professional' price tag. Omissions include the ability to create fillable forms, digital signatures and ID certificates, and facilities for a group of people to collaboratively review and comment on a document. However, since AbleWord can import PDF files and export Microsoft Word documents, it does allow PDF to Word conversion.

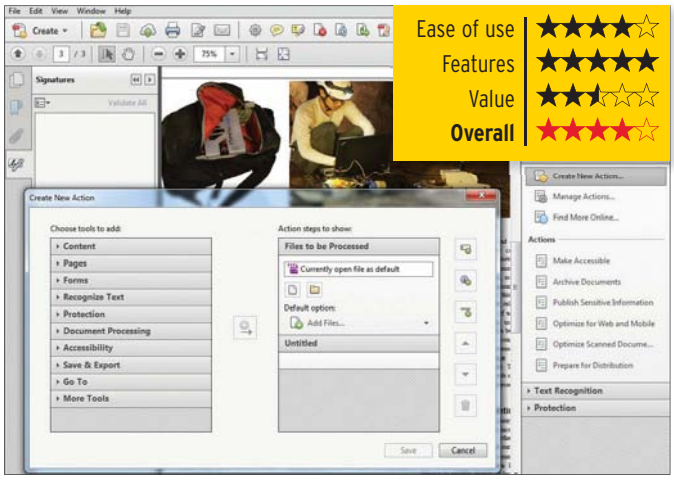
AbleWord may not be as feature-packed as Microsoft Word but it is very much more capable than the free WordPad bundled with Windows. In our first test we opened a Word document that contained sophisticated formatting such as headers and footers, text boxes, images and multicolumn text and, while it didn't appear exactly as it had in Word, much of the formatting did appear correctly. Indeed, the fact that we were easily able to correct the formatting errors proved that all these formatting options were present, even though the file had been partially misinterpreted. More importantly, the same Word document, first converted to a PDF and then imported into AbleWord, was reproduced perfectly and this is, after all, our main interest.

When exported from AbleWord to Word again, the document looked perfect, although, because of the PDF format, the multicolumn text had inevitably been converted to text boxes so the text no longer flowed from one column to another. More disconcerting was the fact that each line had also been converted to a paragraph, so the text lost its justification (alignment at both edges). This, though, was a severe test, and for general-purpose PDF editing, even of documents with advanced formatting features, AbleWord was more than capable. It also provides spell-checking (albeit currently only US English) and is able to generate tables.

VERDICT: Although primarily a word processor, the fact that the free AbleWord can read and write PDF files makes it more than capable of acting as a PDF editor, thereby suggesting comparison with some seriously expensive competition. While the professional aspects of professional PDF editors are missing, AbleWord is perfectly capable of simply editing PDF documents.

ADOBE ACROBAT XI PRO

£438 inc VAT • adobe.com/uk



As the product of the company that devised PDF, Adobe's Acrobat XI Pro is the one against which the others tend to be compared, and it's the most expensive by a big margin. Is its reputation justified and, for that matter, does it really represent value for money?

The latest version of Acrobat Pro, which is reviewed here, was released over two years ago. This hints, perhaps, at a mature product with little in the way of useful features still to be added. Somewhat unusually, though, one feature is in the process of being withdrawn. That feature is integration with FormsCentral, a subscription-based service for the creation and management of online forms. Adobe says the FormsCentral integration is being retired due to lack of support and to allow the company to concentrate on mainstream PDF creation.

Although we've referred to Adobe Acrobat XI Pro as a PDF Editor, as with most packages it also allows you to create the PDF in the first place. This is achieved in two ways. First there's a print driver so you can print a document, as you would to a real printer, but the end result is the creation of a PDF file. Secondly, extra toolbars are added to Microsoft Office apps and creating a PDF this way offers several addition features such as combining multiple Office documents into a single PDF, preserving links, mail merging and more.

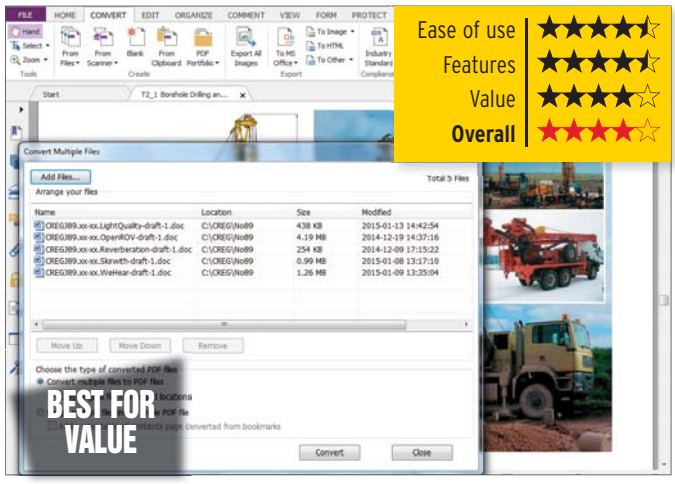
In terms of the advanced features that are found in professional PDF editors, Acrobat offers digital signatures (which add a graphical representation of your signature), ID certification (which allows a recipient to verity that you originated a PDF and it has not subsequently been altered), the facility for multiple users to review a document and add their comments, and the ability to create forms that can then be filled in within the document.

Editing features are extensive and easy to use. Because of the PDF format, though, and as with all PDF editors, text with advanced formatting may be presented in boxes with no text wrapping to the next box. This means that while minor edits can be carried out with ease, making major amendments to a PDF file really isn't feasible if the document has a lot in the way of sophisticated formatting.

VERDICT: Adobe Acrobat XI Pro is a fully featured product and we're tempted to sum it up with that well-known phrase, 'it does exactly what it says on the tin'. However, while it is the de facto standard against which others are judged, we do have to question whether that justifies the massive price tag.

FOXIT PHANTOMPDF BUSINESS 7

£84 inc VAT • foxitsoftware.com



Foxit PhantomPDF Business 7 is among the cheaper of the PDF editors aimed at professional users and, while there are cheaper products on the market, it represents a huge price saving compared with the de facto standard, Adobe Acrobat XI Pro, which is more than four times the price. Here we investigate whether this middle-of-the-road pricing has resulted in a middle-of-the-road level in performance, usability and features.

To set the ball rolling, we'll investigate what PhantomPDF Business 7 provides in the way of its basic functionality. First and foremost, it offers a means of generating PDFs. This can be done within any Windows application via a print driver or by using the additional toolbars that are installed in Office applications. You can also carry out batch conversions, which offers a major time saving when you have a lot of files to convert.

Then, you get full editing tools for PDF files as well as commenting facilities for collaborative review, plus the means of exporting from PDF to a Microsoft Office file format to an image, an HTML file or plain text. You can add user input fields of various types so that your plain PDF document can be turned into a form, and you can sign it with a visible signature or an ID certificate. All this is much as you'd expect from a fully featured professional PDF editor and, in this respect, it is comparable to several other products.

Where Foxit PhantomPDF Business 7 does stand out, though, is in the attention its manufacturer has paid to help get you up and running with the minimum possible hassle.

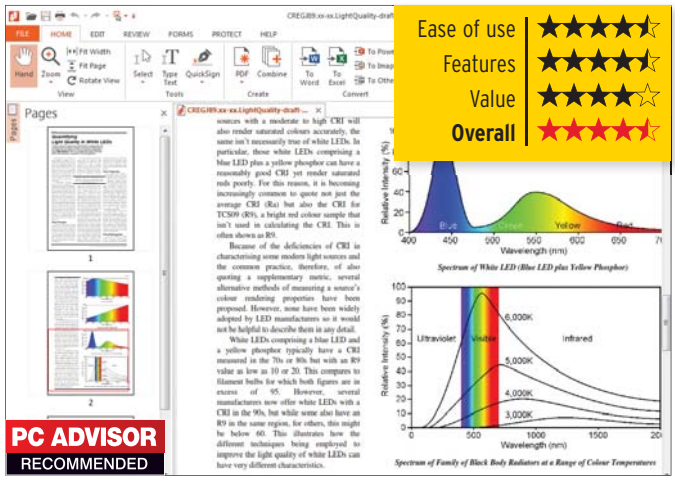
The use of a ribbon interface rather than old-style menus is one example of the attention to detail evident in the user interface, albeit this is perhaps not a huge advantage and by no means a unique feature among PDF editors. However, what we particularly liked is that on first starting up the software we were offered quick links to several YouTube videos that explain precisely how to carry out some of the more commonly required actions in the program.

The opening screen also gives you the support phone number, albeit one in the USA, and more useful for UK users, a link to raise a so-called 'trouble ticket' online.

VERDICT: Foxit PhantomPDF Business 7 provides the level of functionality that the professional user has come to expect at a particularly keen price. The user interface is modern and easy to use, and the manufacturer has accompanied the program with no end of tutorial videos and easy access to support options to get you up to speed in record time.

NITRO PRO 9

£113 inc VAT • gonitro.com



One look at the list of features on offer here is enough to suggest that Nitro Pro 9 offers much the same functionality as several other fully featured business-oriented PDF editors, perhaps most notably Adobe Acrobat XI Pro. However, given that these various packages differ considerably in their price, and Nitro Pro 9 is little more than a quarter of Adobe's offering, it is worth considering whether it suffers by comparison or simply represents excellent value for money.

Nitro Pro 9 provides facilities for PDF creation and editing, form creation, digital signatures and ID certification, and commenting, plus optical character recognition (OCR) so that scanned paper documents can be turned into PDFs that are truly editable. This sounds pretty much identical to several other product offerings, though, so how substantial are the differences?

To be honest, a lot of the differences come down to bells and whistles or even personal preferences. Aficionados point to slight ease of use deficiencies in the editing compared to the Adobe offering, but it's hard for most people to get excited about such differences. Given that there will inevitably be a limit to how much you want to edit within a PDF file, the features are perfectly adequate for most users.

Indeed, the provision of the familiar ribbon interface, a feature which isn't universal among PDF editors and isn't present in Adobe Acrobat XI Pro, will make many users feel immediately at home. Meanwhile, other features have clearly been designed to provide a sense of familiarity to Acrobat users. A classic example is the extensive reviewing features (adding notes, marking up the text, and so on), perfectly self-explanatory and easy to use in themselves, but with much the same look and feel as Acrobat. One notable drop-off is an ability to embed multimedia content.

Compared to Acrobat, the lack of integration with an online system for managing ID certificates might sound like a disadvantage. However, Nitro Pro 9 supports ID certificates and you could always subscribe to a third party management service. Indeed, you still have to pay a subscription to use Adobe Acrobat's EchoSign service.

VERDICT: In buying Nitro Pro 9 you have to accept that there are drop-offs compared to Adobe Acrobat XI Pro, but we'd be surprised if these would really be an issue for the majority of users. This is a fully featured package with excellent ease of use and represents excellent value for money.

NUANCE POWER PDF ADVANCED

£140 inc VAT • nuance.com



Nuance Power PDF Advanced is one of the considerable number of packages offering facilities for creating, editing and managing PDF files. More specifically, it's aimed at the professional business user, so it provides several features that really only apply the needs of businesses. As such, it's not exactly a cheap package, and if you don't need the professional features, as most home users probably won't, then you can buy a PDF editor for much less. However, if you do consider yourself a power user, it is well under half the price of the flagship Adobe Acrobat XI Pro.

First impressions are favourable, with Power PDF Advanced offering the now familiar ribbon interface popularised by Microsoft Office, and which many users will prefer as it avoids having to work down through several levels of menus. This isn't universal among PDF editors, with Acrobat the most obvious alternative to have stuck with the more conventional menu-based interface.

This is just the icing on the cake, though, and Power PDF offers features which, at first sight, are exactly what you'd expect of a business-oriented PDF editor. In particular, you can create PDFs, either using a pseudo printer driver from any Windows software or you can use the toolbars provided in Office applications. You also have full facilities for editing PDFs although there are certain restrictions, as a result of the format of PDF files. Accordingly, the scope for editing will always be limited compared to the facilities offered in the software used to create the original document.

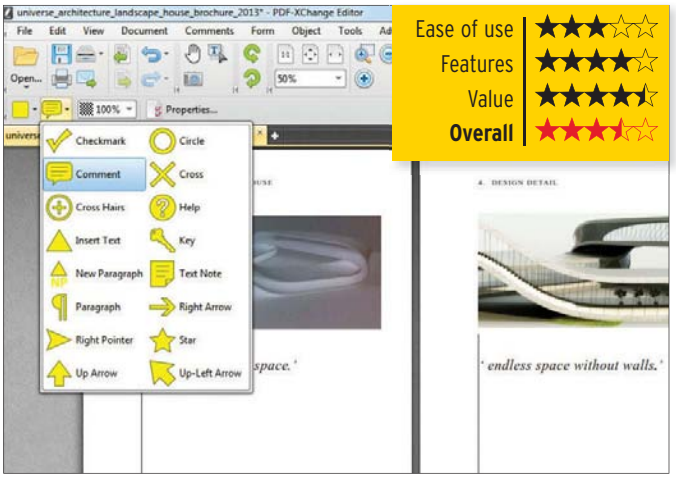
More professionally oriented features in Nuance Power PDF Advanced include digital signatures and ID certificates for security purposes, tools for collaborative review, the ability to create forms that can be filled in later, batch processing for converting several PDFs without continual human supervision, and provision for embedding multimedia content.

In operation, we found the software to be intuitive and easy to use. We have little doubt that most users will soon be up and running. The reviewing features are particularly comprehensive, proving means of commenting, marking text in various ways and drawing, although there's surely a limit to how many different ways you need to draw attention to the different parts of a document.

VERDICT: This isn't the cheapest business-oriented PDF editor but it isn't the most expensive either, and by a considerable margin. If going for a cheap alternative leaves you uneasy – and if your business depends on it, we can understand such concern – Nuance Power PDF Advanced provides a lot of software for the money.

TRACKER PDF XCHANGE PRO 2012

£52 inc VAT • tracker-software.com



With a price considerably below most of the competition and a fraction of what Adobe Acrobat XI Pro costs, Tracker PDF XChange Pro 2012 is one of the cheapest PDF editors intended for business use. Do you only get what you pay for, though, or is it more the case that the competing products are overpriced?

When you install this product you don't end up with just one new application on your system but three: Tracker PDF XChange, PDF-Tools 4 and Office2PDF5. This doesn't necessarily mean that you're getting more for your money, though – indeed, it might just mean that you spend your time flipping between applications rather than the one-stop-shop approach of other PDF editors.

Like virtually all competing products, you can convert a document open in an Office application to PDF using either the Tracker print driver or from the toolbar added to your Office products. However, while batch conversion of Office documents to PDF is normally carried out within the PDF editor, the Tracker solution involves using the separate Office2PDF5 utility. The need to use something other than the main package continues with PDF-Tools 4, a utility with facilities for generating PDFs from images, text files or a scanner, converting PDFs to Word documents (but not Excel), and various other actions such as splitting and merging PDFs.

Unlike many of its rivals, which have adopted the ribbon paradigm that many have come to expect from using Office applications, but also unlike Adobe Acrobat XI Pro, which uses conventional menus, PDF XChange uses an interface that can be thought of as half-and-half. In itself this is only a minor drawback but it does add to the usability issues already mentioned. Having said this, a large toolbar presents many of the most commonly used features in a clear manner, thereby removing the need to search through menus to perform these actions.

Despite the ease of use issues, Tracker PDF XChange does offer pretty much all the features a business user would expect. Included here are forms creation, optical character recognition, signing both visible and as an ID certificate, and reviewing tools.

VERDICT: At significantly less than almost all other business oriented PDF editors, yet providing the functionality you'd expect, Tracker PDF is worthy of consideration. The downside is that some of the functions you'd expect to find in the main package are in separate utilities, though this is a minor inconvenience, given the price. ☒

DROPBOX MOBILE

Managing, editing and syncing sorted

Dropbox Mobile used to let you look at your files but little else. Now, it offers all the features you can get from a desktop, including superb integration with Microsoft Office. By Liane Cassavoy

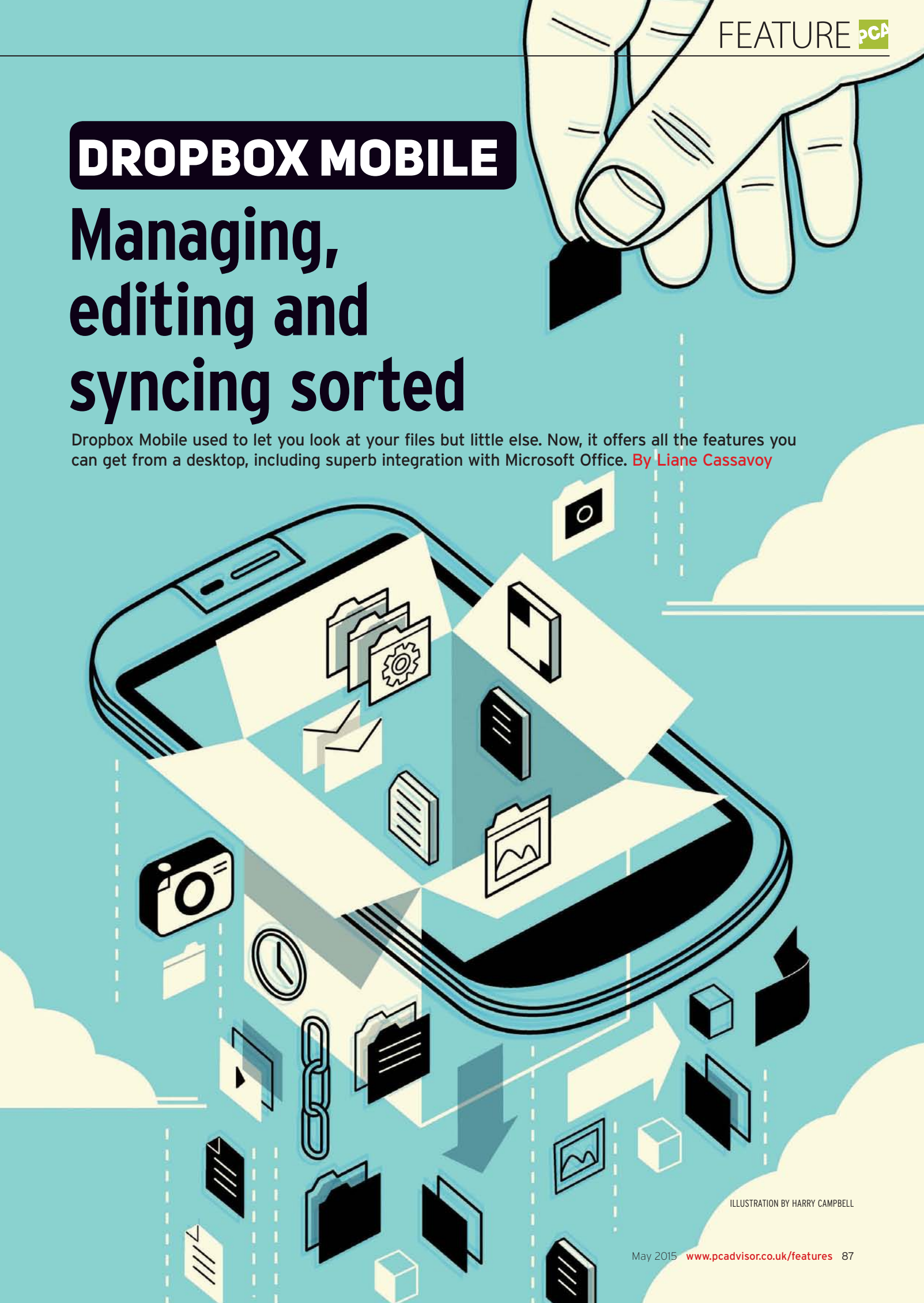
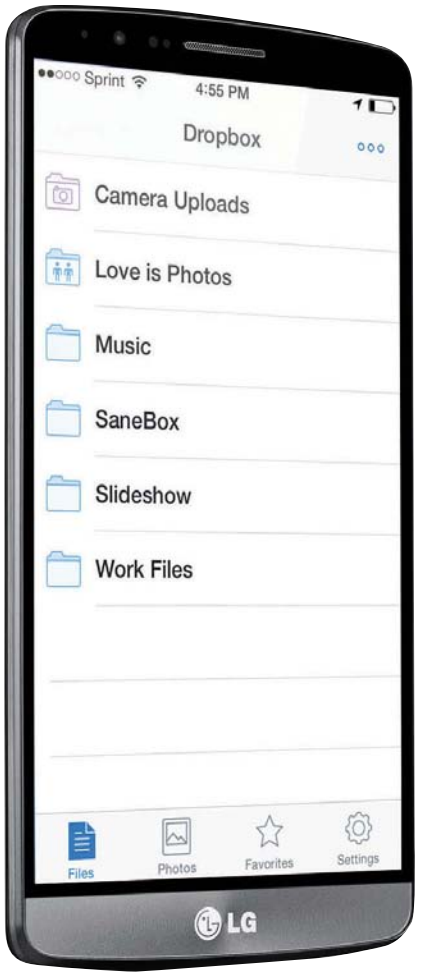


ILLUSTRATION BY HARRY CAMPBELL

DROPBOX

The very useful cloud-based Dropbox storage service used to be fairly limited when it came to mobile. You could see the files you had stashed in your Dropbox, but couldn't do a whole lot with them. That's changed with some recent updates to the Android and iOS apps for the service.





Basics – covered

Dropbox Mobile (dropbox.com/mobile) lets you do much of what you can do when using the desktop app or accessing Dropbox via the web. You can browse your folder library, delete and rename files, share them via social media, email or text message, and generate links to folders and files. Indeed, I found it easier to share a file using Dropbox Mobile than I did on my desktop, though it's not a difficult task on either device.

I also like how Dropbox Mobile is able to play back a variety of multimedia files, including audio and video. I was able to stream a .wmv video seamlessly, though performance will clearly depend on the strength of your wireless connection.

It's also a handy way to enjoy your music collection if space is limited and you don't want to download the lot to your mobile device. Don't expect music playback features to rival your phone's built-in player, though; Dropbox will play only a single file at a time. If you want playlist-like continuous playback, Dropbox is not the app for the job. And keep in mind that streaming a lot of audio and video could rack up some data charges, depending on your account.

Microsoft Office Integration

One of the biggest limitations of using Dropbox on your mobile device was the inability to edit files, especially Microsoft Word files. It was frustrating to be able to see a list of your files but not be able to edit them without going through some pretty time-consuming workarounds. Now, though, Dropbox features tight integration (tinyurl.com/ov9wyLw) with Microsoft Office, and those ties have made their way to the mobile app. When you open a file stored in your Dropbox, you just click an icon at the bottom

I found it easier to share a file using Dropbox Mobile than I did on my desktop



There was a slight delay in opening long files, but I was pleased to see how quickly all my edits were saved

of the screen to edit it, and the app asks you if you'd like to do so in the appropriate Microsoft Office app.

I tested several Word files, including some very long documents and a couple with extensive formatting. There was a slight delay in opening long files, but I was pleased to see how quickly all my edits were saved. All changes were seamlessly saved to Dropbox, and synced to my account for immediate availability across my devices. The integration goes both ways too. When you create a file using the mobile Microsoft Office apps, you can choose to save it directly to your Dropbox.

This integration with Office makes Dropbox Mobile a must-have for me, as it eliminates the one big annoyance I had with it. Productivity doesn't come free, though. To edit files in Office apps, you'll need an Office 365 subscription, which costs £79.99 a year.

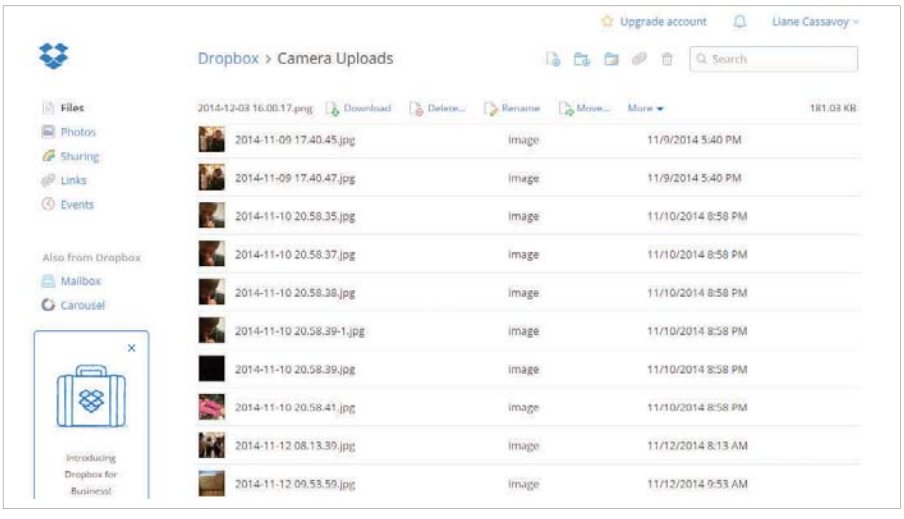
More tools

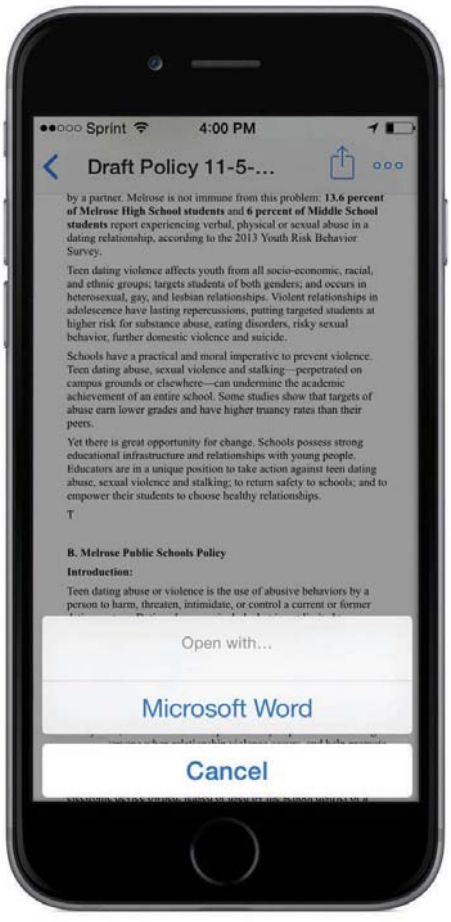
Anyone who's ever lost a phone that's full of photos and videos will appreciate Dropbox Mobile's Camera Upload feature. It automatically syncs all the photos and videos that you capture on your mobile device to your Dropbox account, neatly arranging them by date taken. It's a drop-dead simple way to back up all the images you capture. By default, Dropbox uploads the photos only when your device is connected to Wi-Fi, but you can allow it to use your mobile's data network, too.

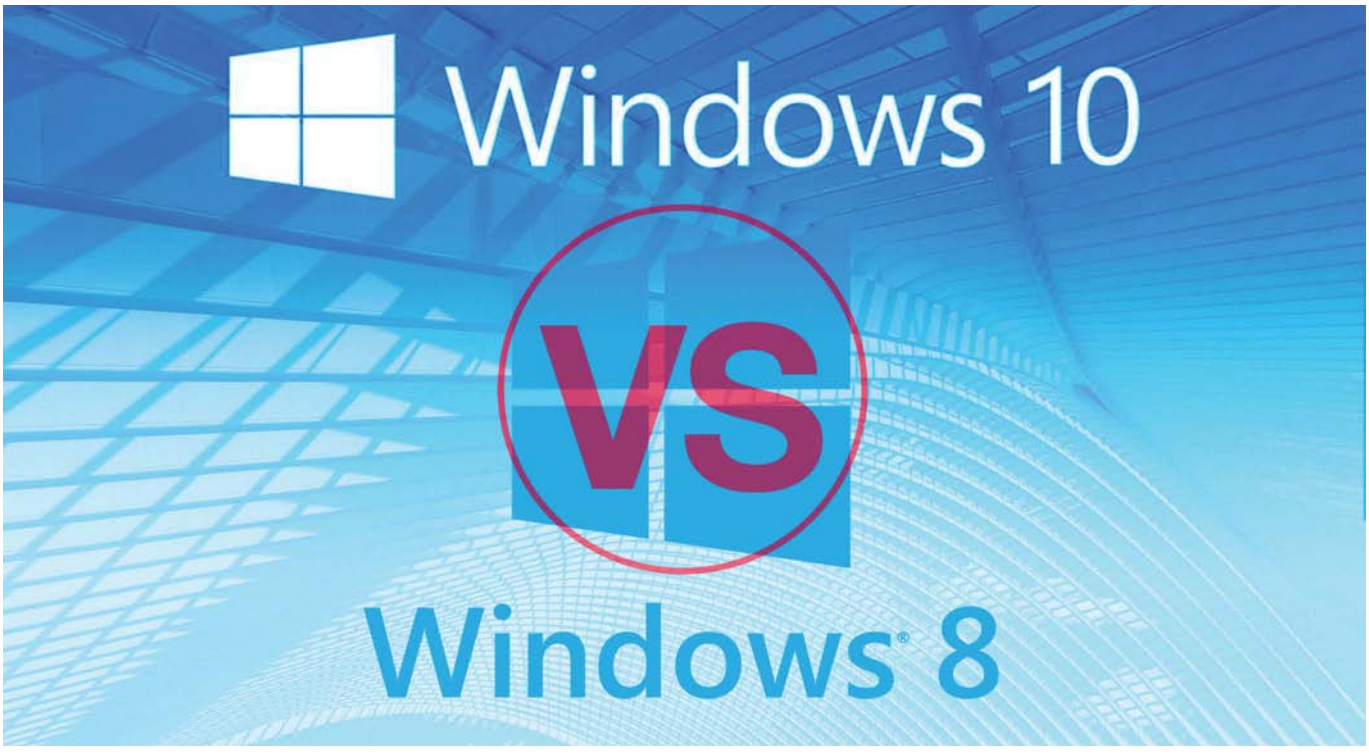
Dropbox Mobile has some other features that I was unable to test, but they sound promising. The Android app allows users to export files directly to SD cards, and Dropbox for Business users can connect both personal and business accounts for separate access from within the same app.

Dropbox Mobile is by no means perfect. I wish it could play music continuously, for example, and that you could sort files by type rather than just by date. But it's an insanely useful addition to an incredibly useful service, and it's made even more so by its Microsoft Office integration. ☒

It automatically syncs all the photos and videos that you capture on your mobile device to your Dropbox account







What's the difference between Windows 10 and Windows 8? Matt Egan reports

The latest Windows 10 release is available for testing, offering a host of new features. Plus, it will be free. Here we compare Microsoft's upcoming operating system with Windows 8.

UK price and availability

Windows 8 is widely available right now. If you buy a new PC or laptop, it will almost certainly come with Windows 8 (version 8.1 these days). As an end user, you will not know how much your PC's manufacturer paid for the OS, but if you purchase an upgrade or buy a licence outright, you will have to shell out. A standard Windows 8.1 upgrade licence will cost you around £79, a Windows 8.1 Pro licence is priced at £189.

Compare that to Windows 10. The operating system isn't yet available, and will likely launch in the autumn. In the meantime you can install the preview version, for free. It is a beta, meant for developers, so we wouldn't recommend that just anyone attempts to use Windows 10 for their main PC. Not just yet, anyway. But the good news is that when the operating system launches, it will be a free upgrade for existing Windows 7, 8 and -Phone users.

So if you are a Vista or -XP user, you may want to think about upgrading now. Even if you jump only to Windows 7, Windows 10 will be free.

WINDOWS 10

Devices

Right now there are three different types of operating system that could reasonably be called 'Windows 8'. Four, if you count 64- and 32-bit versions. Windows 8 itself is x86 software built for use with PCs and laptops, as well as some tablets. Then there is Windows RT, which is for use on other tablets. Finally, there is Windows Phone 8 (which explains itself). Windows 10 will, at least in principle, do away with these divisions.

Microsoft claims that its new operating system will run on all Windows PCs, laptops, tablets and phones. More importantly all Windows 10 apps will work across all of those devices. It's a bold claim, and an exciting one. It's also a claim that we can't even begin to assess until the first consumer beta of Windows 10 on a smartphone comes out.

Start Menu

The Start Menu is back in Windows 10, in more of a way than it is within Windows 8.1. The return of the Start Menu is a key change to the desktop. In Windows 10, the Start Menu is improved, in such a way that it may make Windows apps useful, even without the ability to use them across all Windows devices. The Windows 10 Start Menu includes a list of frequently used apps and shortcuts to PC settings. Here you will also find documents and pictures folders. At the bottom there is an 'All apps' shortcut.

And Microsoft has retained the functionality of the Windows 8 Start





screen over on the right, with resizeable Live Tiles, so that you can immediately check unread mail or Calender appointments. The Start Menu is customisable – you can resize it and rearrange the tabs. You can also revert to the Windows 8 Start page, should you wish to.

Xbox

Finally, Microsoft is attempting to make use of the awesomeness that is Xbox, within the dreary world of Windows. Whereas Windows 8 users can install an Xbox app on to Windows PCs, it really doesn't offer much of the true Xbox experience. In its upcoming OS, Microsoft aims to change that.

With Xbox on Windows 10, Microsoft is attempting to add the best features from Xbox Live and the Xbox console. It comes with its own built-in Xbox app, offering a unified view of your games, the activity of your friends, and your own gaming activities. Windows 10 also bakes in Xbox Live, so that the more than 50 million players can connect across multiple devices in new ways.

It remains to be seen how well Windows 10's Xbox implementation will work. But if Microsoft can deliver on its vision of streamed gaming sessions enjoyed wherever you are on a Windows 10 device, it will be a literal game changer. And a massive improvement over Windows 8.

Cortana

Another key new feature of Windows 10 not available in Windows 8 is Cortana – Microsoft's semantic digital assistant. A kind of super Siri, which can engage you in conversation. More than simple speech recognition, Cortana constantly scours the web for information to inform its interactions with you. And it learns from your behaviour, contacts and so on, in order to better serve your needs. Cortana on Windows Phone is pretty great. And it improves with use. So the inclusion of Microsoft's digital assistant is a big boost over Windows 8.

Search improvements

Universal search in Windows 8 is a much-undervalued feature. It's been in Windows since Vista, but came to maturity in Windows 8. Searching to load up apps and files is much more efficient than navigating via apps and file systems. And going by the Windows 10 preview, Microsoft has made strides in this area.

The new OS has added a search button to the taskbar. This pulls one of the few important aspects of the Windows 8 Start page into the desktop. Microsoft officials tell us that Search and File Explorer now displays your recent files and frequently visited folders. This should make finding files you've worked on faster and easier.

Snap Assist and windowed apps

With Snap Assist every app in Windows 10 can be dynamically resized in a window. And unlike in Windows 8 – where a snapped app takes up half the screen – in Windows 10 up to four apps can be snapped per screen. This has the potential to be a killer productivity app – true multitasking in a single window.

Even better, Snap a document to one side of the screen, and Snap Assist will suggest others that you may wish to open. Snap an app and Windows 10 suggests another, similar app that you might want to snap next to it. The feature is intended to save you the hassle of hunting about through menus to actually construct a virtual desktop. Time will tell whether these suggestions will prove useful, but it's a good start.

Task View, virtual desktops, Alt-Tab

Another useful and visual productivity enhancer is the way that Task View allows you to create a kind of multi-monitor setup within a single monitor. As with previous versions of Windows, you can use Alt-Tab to quickly shuffle between windows. The killer difference here is the new Task View button. Third from the left in the Windows Taskbar is the Task View button. Press it – or hit Windows+Tab – and you will see an array of 'virtual desktops', virtual displays into which you can snap multiple apps. So you could keep your email and web browser on one desktop that you hide away when you are working on an Excel spreadsheet. ☒

WINDOWS 8

MICROSOFT SURFACE PRO 3





How to make money from your hobbies

Whether you're an artist, a photographer, a writer or even a globetrotter, there's a way to turn your hobbies into readies. Ashleigh Allsopp explains how to make hard cash from your passion

Hobbies can be incredibly fun and fulfilling, but earning some extra cash from them takes something you love to an entirely different level. Possibly the most obvious way to make money from your hobby is to sell your creations. While this can't apply to every hobby, if you're into sewing or knitting, or maybe make jewellery, or enjoy painting and drawing, you'll have physical items you can sell online. You might be surprised about how many different places offer opportunities to sell your work, so it's worth investigating which works best for you.

Sell your creations on eBay

The first place you might want investigate is eBay, which is the most popular online auction site right now. You can sell just about anything on eBay, from tiny charms worth a few pennies right through to luxury cars and pretty well anything else you can think of.

It really depends on what exactly it is that you're intending to sell, but one of the problems with eBay is that so many people from all over the world are using it to sell their stuff that your item can easily get lost among all that.

If you do decide that eBay is the place for you to sell your creations, you'll want to keep in mind that you'll have seller fees to pay. As a private seller, you'll be able to list up to 20 items for free each month (sometimes eBay promotions mean that number rises to 100 for a limited time), but you'll still need to pay eBay a 10 percent fee on the total transaction amount including postage as well as a PayPal fee if your buyer pays using the online payment service.

If you intend to sell lots of your items on eBay, you may have to set up a business account, which means fees may vary depending on the type of item you're selling. If you manage to become a particularly successful eBay seller and get top-rated status, you'll get a fee discount.

Amazon

Then there's Amazon, which allows third-party sellers to sell their wares on its platform. These days, many people will automatically think to check Amazon for pretty much anything they're thinking of buying, so it's a good place to be when they come looking.

As with eBay, though, sellers' fees apply and can be far more than eBay's. It depends what you intend to sell, but, as an example, if you want to sell jewellery you'll pay a listing fee of 75p plus a 25 percent referral fee from Amazon at a minimum of £1.25.

Etsy

A better option than Amazon is Etsy, which is set up to help people sell their creations. You can sell handmade or vintage items on Etsy, including art, homeware, mobile accessories, jewellery, clothing, wedding items and craft supplies. Fees on Etsy are significantly lower than Amazon and eBay. You'll need to pay $0.20 (around 13p) for each listing, and that listing will last for three months before you need to renew it and pay the listing fee again.

You can increase the quantity of an item for sale without having to pay the $0.20 listing fee, but that fee will be charged when you sell those additional items. Then, when your item is sold, you'll also be charged a 3.5 percent transaction fee which doesn't include shipping or tax.

Other places online

For some people, other websites might be more suited to their particular hobby. For example, artists, designers and illustrators should check out Threadless, which offers the potential to earn you money should your designs be taken on by the company. Similarly, it's worth investigating Ohh Deer and Art Rookie.

CafePress is worth a look too. It offers the ability to open your own store that lets you

have your images printed on T-shirts, scarves, cushions, mugs and much more, and you don't even need to deal with the printing part yourself as CafePress will do all that for you.

Sell your creations on your site

There's always the option of creating a website as your own online shop for selling your items. It's trickier to get your products in front of as many people that way, as you won't have the benefit of eBay, Amazon and Etsy's registered buyers, but if you're starting to get serious about your hobby and want to take it a step further into the professional realm, it's a brilliant thing to do.

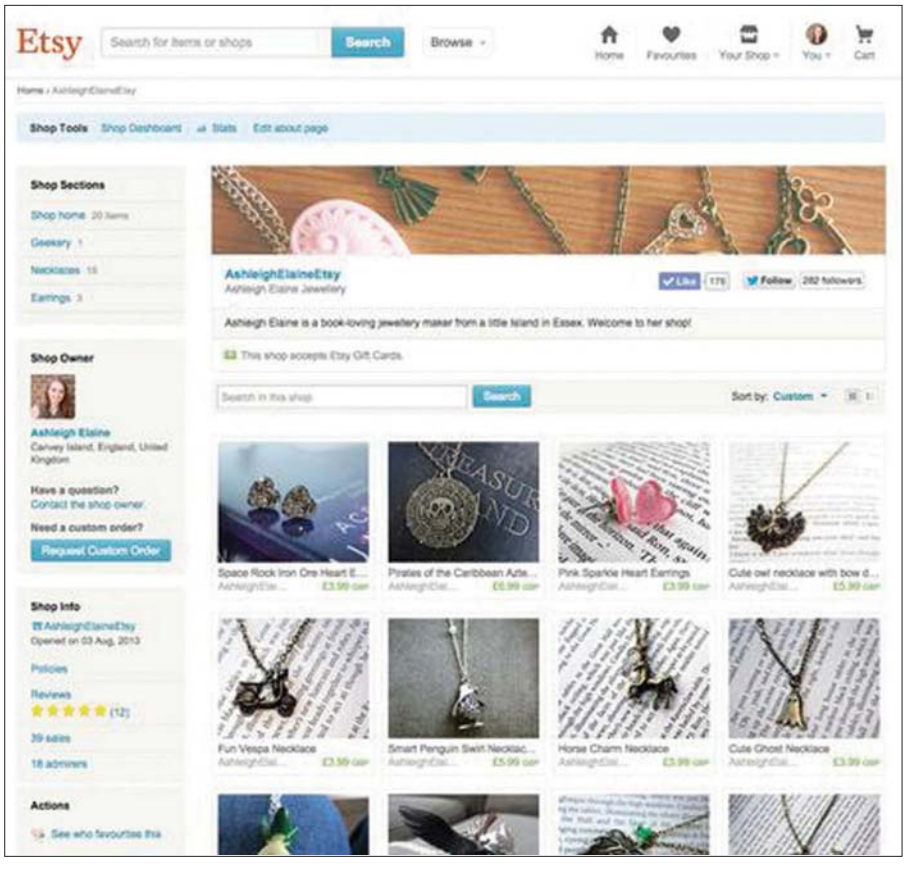
We've been using 1&1's new MyShop feature for MyWebsite, which lets you build a website from scratch using the easy-to-master template-based website builder, and then quickly and easily integrate an online store into that website.

It's as simple as dragging and dropping, and if you've already taken some good photographs of your products for use on one of the big online selling sites, you can have your website up and running with fully functioning e-commerce built-in and a really nice, unique design within a day or two.

MyShop also offers the option to automatically create invoices and delivery notices for every order, and lets you add different payment and delivery options to cater for a wider range of buyers. An inventory management system will make sure you don't sell anything that you haven't got in stock.

As mobile usage grows it's important to make sure that your website is accessible to users of smartphones and tablets, and helpful. 1&1's MyWebsite and MyShop are fully optimised for mobile.

To use 1&1's MyWebsite and MyShop, you can first go for 30-day trial to decide whether you like it and if it works for you, and then it'll cost you from £19.99 a month

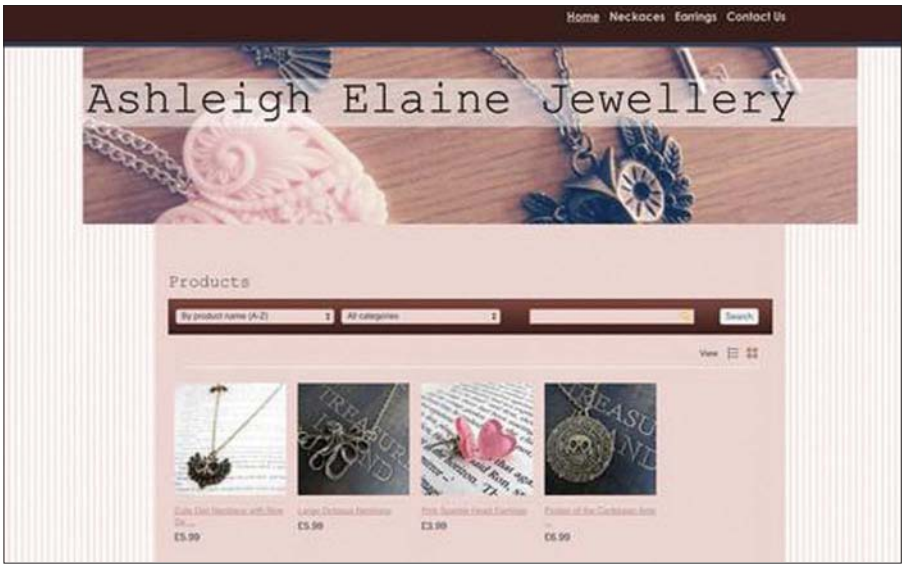


ART OF CRAFT Set up to help people sell their creations, Etsy charges much lower fees than Amazon and eBay

for the service, so you'll want to make sure that you'll be earning more than that if you don't want to end up losing money. You'll also need to order a domain name; domain names often come free as part of the website building package but some extensions may cost you around £2.49 each.

Within that package, you'll also get 200 email addresses, assisted search engine optimisation to help you show up in Google, a library of images that you can use on your website, the ability to sync a Facebook page with your website, a newsletter service for online marketing, a £40 PayPal voucher and your online shop for up to 1,000 products.

Other ecommerce options include Shopify, Big Cartel and more, which are also used by professionals and hobbyists wanting to sell their creations.



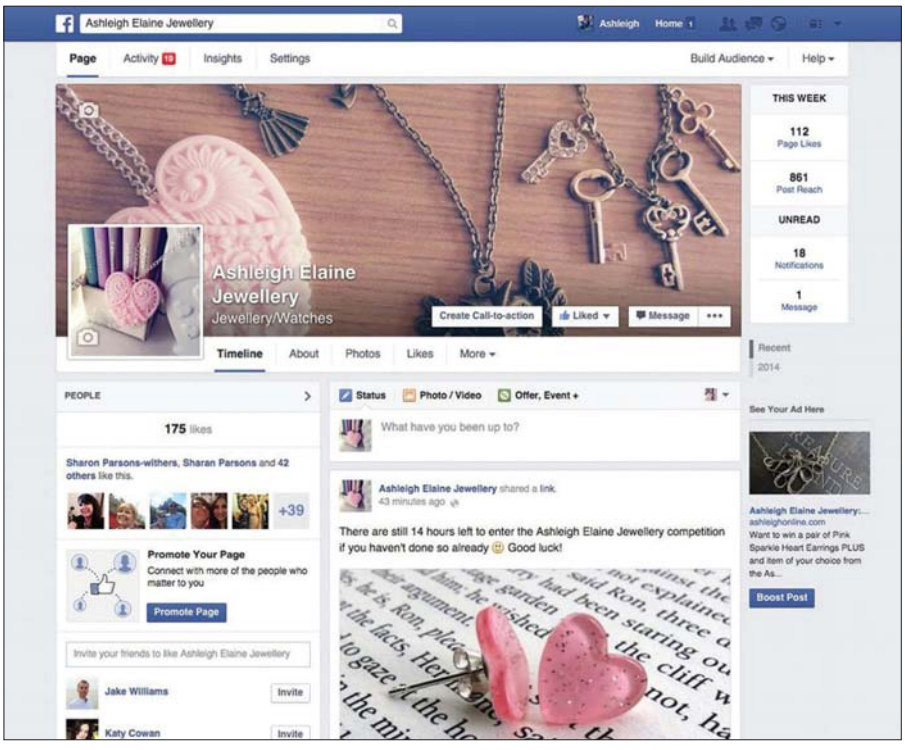
Use social media to generate sales

In order for any of the above methods of selling your items online to be successful, you'll also want to promote your brand on social media. This includes Twitter, Facebook, Instagram, Tumblr and Pinterest. You may not need to use all of these networks, but it's worth trying each of them out to see how successful they are for your creations.

Even if you decide not to build your own ecommerce website and stick with one of the other sites mentioned instead, it might be worth starting a blog. That way you can share what it is you're working on and direct people to the online marketplace where they can view and buy your stuff.

It's important to remember that building a social audience takes time and effort. You need to post regularly, and follow and interact with potential customers and other brands.

A SHOP FROM SCRATCH 1&1 lets you build a website with its own integrated store from scratch using templates



SOCIALISE TO ADVERTISE You can use social networks like Facebook to help drum up business

You could try running a competition to help boost followers using Rafflecopter or Gleam, for example, and you can also try sending items to reviewers on relevant blogs for additional promotion.

Sell your photographs

If your hobby is photography, using the methods already outlined here to make money is not necessarily going to be the best option. You could create canvases with your photographs on or framed prints and sell them online, but there are other options available to you.

For example, you could sell your photos to stock image sites for a small commission. For example, iStockphoto.com lets you contribute images and will pay you royalties for each file download your photos receive.

The same goes for Shutterstock, Fotolia, Dreamstime and more, although some will ask for exclusive rights to your photographs so you may not be able to put the same photos on multiple sites.

Many of these stock image sites will also pay royalties on illustrations, videos and sound clips.

Make money by writing

You can make money by writing. Whether it's the writing itself that's your hobby or it's your hobby (sport, travel, fashion, and so on) which you can write about, both approaches offer opportunities.

Whatever your hobby, we'd encourage everyone to start a blog. It's not going to make you loads of money – particularly not to begin with and quite possibly never at all – but there are things you can do to monetise your writing.

For example, you can sign up to affiliate schemes with any relevant brands to ensure that any time you link to their website from your blog you could earn a cut of the money spent there by your reader.

Amazon offers an affiliate scheme, which you can sign up to for free. Check the very bottom of other relevant websites that you come across – you might find they offer affiliate schemes, too.

Some blogging platforms allow you to make money through advertising, perhaps using Google AdSense, for example.

If you want to make money from your writing in other ways, there are some websites that let you write and submit articles and reward you with cash. If you're an expert in a particular subject (which could well be your hobby), check whether that topic is available to write about on About.com, and then submit an application. If you're accepted, you'll earn money for the articles you write.

You could also try Demand Studios, which offers the opportunity to get your writing published on sites like eHow, LiveStrong, USA Today and more, and earn money from it.

Alternatively, if you're considering writing a novel or book, you could self-publish it on the likes of Amazon's Kindle Store or Apple's iBookstore.

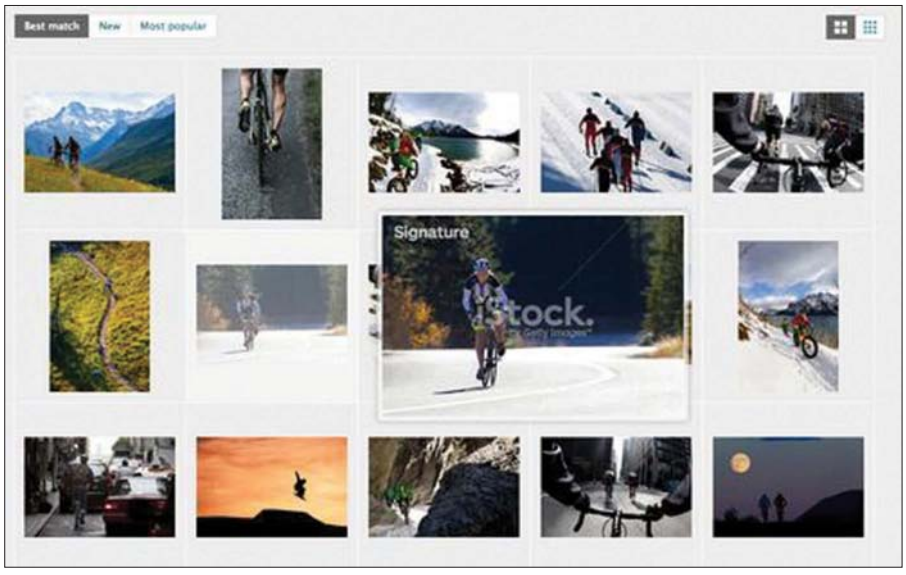
Make money on YouTube

If writing's not your thing, how about videos? You don't need to have the very best camera in the world or be the best or most glamorous presenter. Whatever your kit and presenting skills, putting your videos on YouTube has the potential to earn you some cash by monetising those videos with ads.

Perhaps you can shoot how-to videos demonstrating the skills required for your hobby that you can share with others. Or if your hobby is gaming, how about sharing gameplay videos or walkthroughs on YouTube for others to watch?

Don't expect the money to come rolling in straightaway. As with social media it takes time to build your audience. Yet it's worth remembering that some YouTube stars earn a living (and we're talking millions a year in some cases) simply by making videos in the comfort of their own home.

SNAP AND GRAB You can upload your photos to stock image sites, which will pay royalties if their customers use them



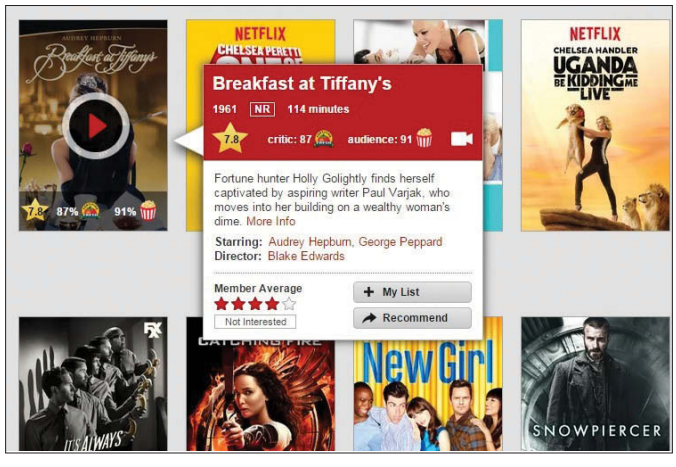
THE BEST NETF TOOLS



BETTER BROWSING

Netflix's catalogue of movies and shows is massive, but you only scratch the surface by using its basic apps and website. When you're really trying to scratch a particular itch, use AllFlicks.net, which lets you search within specific genres, filter movies and TV shows, narrow down a date range, and sort by rating. InstantWatcher (at tinyurl.com/oxhdayL) has a similar tool but not so many sorting options, although it does have a handy synopsis view.

If you just want a quick recommend, try WhatIsOnNetflix.com. The site lists a handful of top-ranked movies from IMDB, Rotten Tomatoes and Metacritic, and its Random Pick tool is especially helpful for the indecisive.



TAKE COMMAND WITH EXTENSIONS

In theory, Netflix's built-in star rating system should work really well, because it's personalised to your interests. But sometimes you just want to watch a trailer and see what critics think before pushing play. The Netflix Enhancer extension (tinyurl.com/np67gre) for Chrome can help, showing IMDb ratings, Rotten Tomatoes scores, and a trailer button when you hover your cursor over a movie.

To gain even more control, install Lifehacker's Flix Plus extension (tinyurl.com/mhbnw58), which adds a heap of customisation options including a 'Darker Netflix' theme and the ability to hide spoilers.

LIX

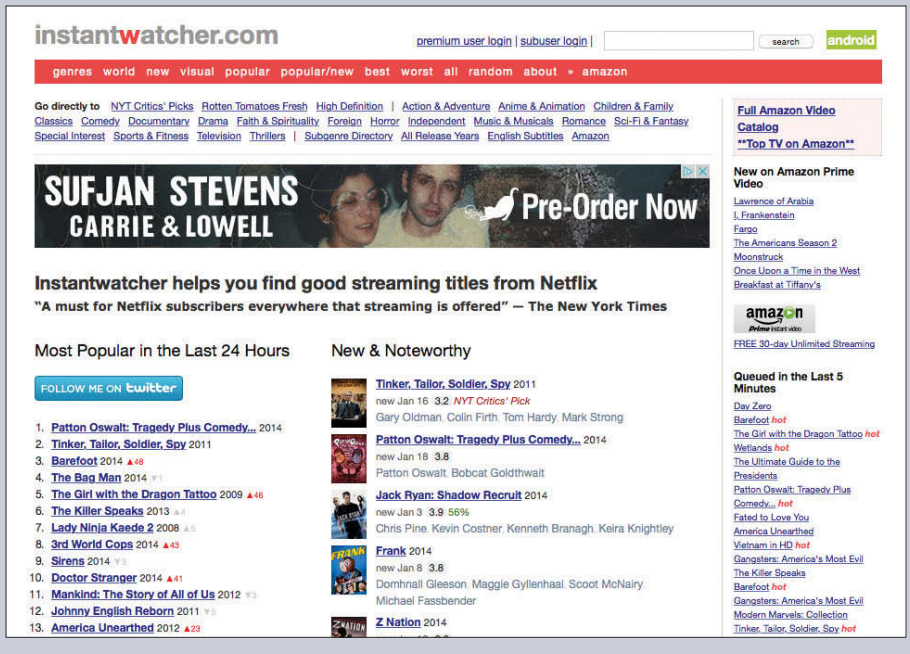
Use these 10 tricks and tips to get the most out of your subscription by Jared Newman



Netflix's simplistic interface may be well intentioned, but sometimes you need more powerful tools to find the best streaming movies and TV shows.

Now that Netflix has killed off its public AP, the number of useful apps and sites for sorting through Netflix video has thinned. But there are still tried-and-true methods for finding the good stuff, along with a few tools and settings from Netflix that everyone should know about. Here are 10 tips for making the most of a Netflix streaming subscription.

WATCH RECENT ARRIVALS AND ABOUT-TO-BE-RETIRED MOVIES



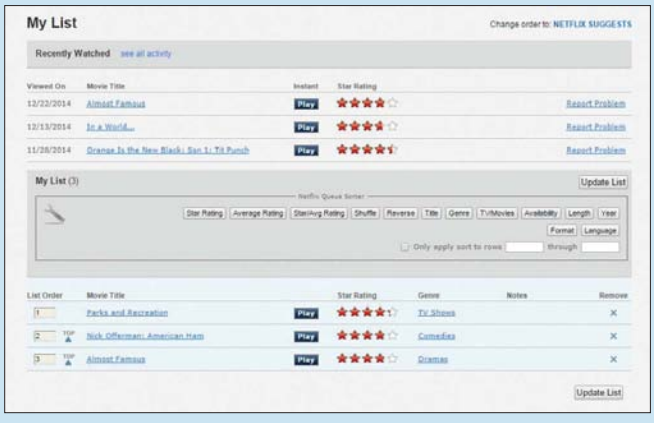
Netflix's New Releases section rarely gives you the full story when you're trying to find fresh movies and TV shows. For that, you can turn to InstantWatcher's Newly Available on Instant section (instantwatcher.com), which offers a complete list of recent arrivals. It also lets you filter just movies or just TV programmes, and it has sorting options for rating and original release date.

You might also want to keep track of which movies and shows will be leaving Netflix. Now Streaming has weekly and monthly roundups, so you can watch the good stuff before it's gone.

GET YOUR QUEUE IN ORDER WITH POWERFUL SORTING OPTIONS

Sorting through the My List (tinyurl.com/owd2x69) section of Netflix's site can become unwieldy if you've built up a massive backlog. Fortunately, a free script called Netflix Queue Sorter (tinyurl.com/pb9L3po) lets you get a handle on your queue in Chrome, Firefox, Opera or Safari. Once the tool has been installed, you can sort your queue according to star rating, genre, title, and more. You can also shuffle the order if you're feeling lucky. Just follow the instructions on Github for your browser of choice.

You will have to turn on Manual Ordering (tinyurl.com/k7c2xve) in Netflix settings for the Netflix Queue Sorter script to run.



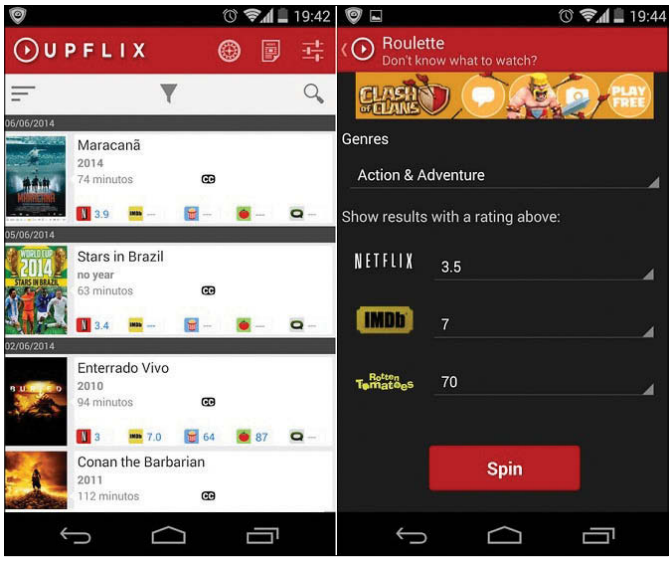
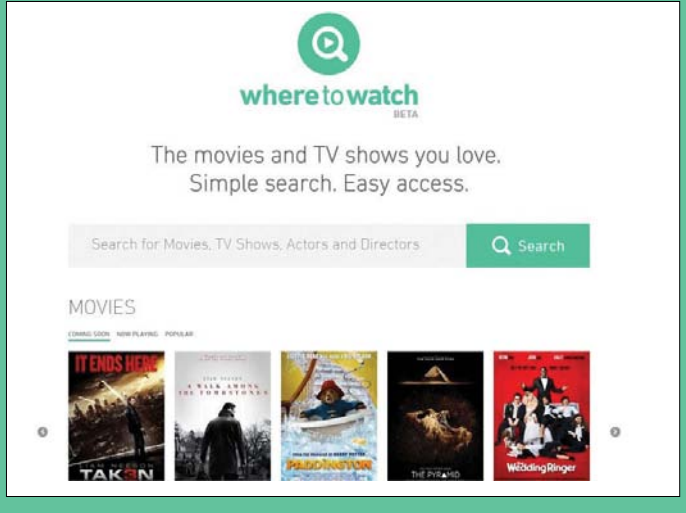


FIGURE OUT WHAT'S ON WITH YOUR PHONE

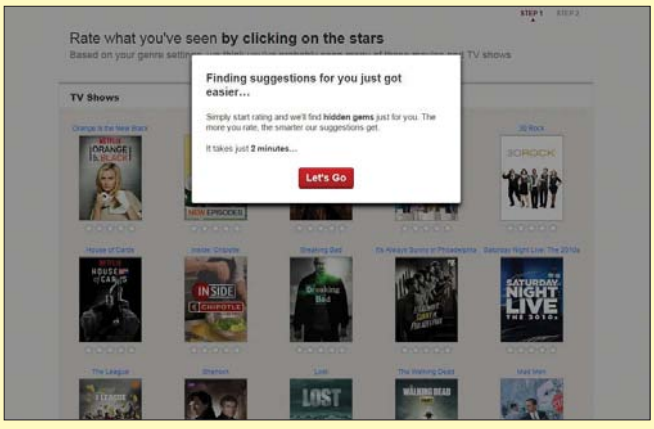
Most power tools for Netflix live on the web, but that makes them cumbersome if you don't have a home cinema or easy access to a laptop. For powerful Netflix searches on your phone, check out Upflix for iOS (tinyurl.com/nkkj96L) or Android (tinyurl.com/qa4gca8). The free app lets you sort movies and shows according to their ratings on Netflix, IMDb, TMDB, Rotten Tomatoes and Flixster. You can also browse dozens of genres and use the Roulette feature to get spontaneous recommendations. When you're ready to watch, you can even jump straight into the Netflix app to begin playback.

GO BEYOND NETFLIX

Searching on Netflix can be a waste of time if you're looking for something specific that the service might not even have. Instead, broaden your search with WhereToWatch (wheretowatch.com), a video search engine that includes several legal online sources, including Amazon, iTunes and Hulu. You can search by title, actor or director, and while WhereToWatch has a few holes, it'll save you the disappointment of coming up empty on Netflix.



SHARPER RECOMMENDATIONS



If you're ever felt let down by Netflix's recommendations, it might be because you haven't fed it enough data. Start by visiting the Edit Profiles (netflix.com/EditProfiles) section of Netflix's website, and make sure everyone in your family has their own profile – don't worry, it's free to have several profiles tied to a single account.

Now head to the Your Account section (netflix.com/YourAccount) of the Netflix website and click on Taste Preferences (netflix.com/TastePreferences), where you can rate how much you care for various genres. You can also use the Ratings Wizard (netflix.com/RatingsWizard) to give star ratings to the movies and shows you've already seen. It's a good way to ensure those banal direct-to-DVD horror movies are permanently banished from your menus.

LEARN SOME KEYBOARD SHORTCUTS

Watching Netflix on a laptop isn't quite as comfy as kicking back with a TV and the remote control, but using keyboard shortcuts are the next best thing. Some of the following controls will also work on other video sites such as YouTube and Hulu, so they're worth remembering:

- Enter or spacebar: toggle pause/play
- Left arrow: rewind
- Right arrow: fast forward
- Up arrow: volume up
- Down arrow: volume down
- M: mute
- F11: toggle full screen (Chrome only)

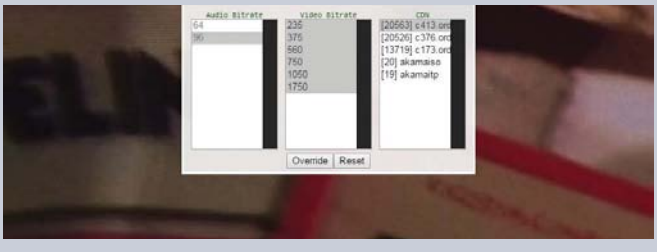




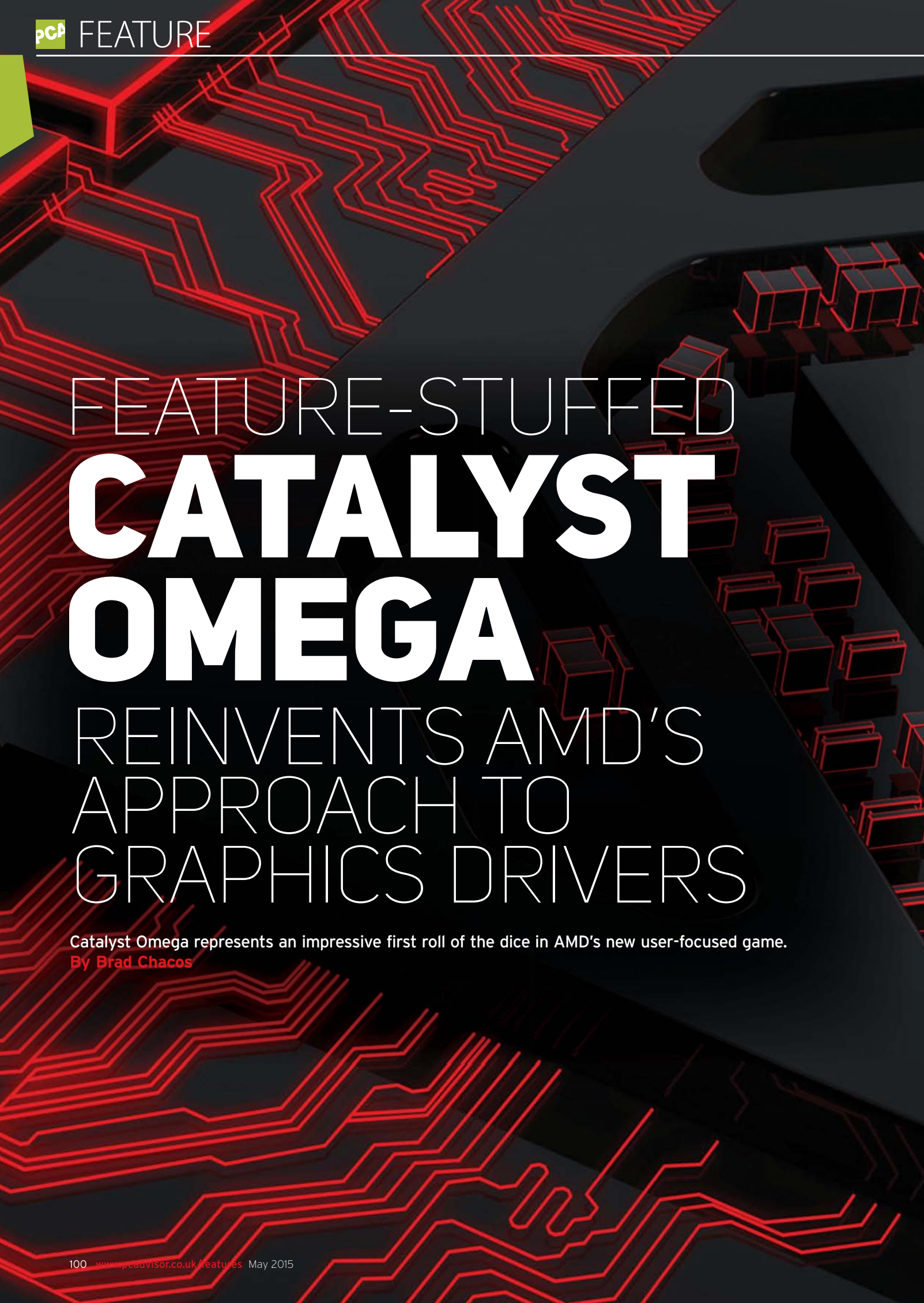
TWEAK YOUR SETTINGS

For those who watch a lot of foreign fare, Netflix's Subtitle Preferences menu (tinyurl.com/pnr2Laa) is worth a visit, as it'll let you change the colour, size and font of all subtitles and captions; it works on all devices except those running iOS, which have their own instructions (tinyurl.com/qfj295a). You should also check out the Playback Settings menu (tinyurl.com/ke9gxtu), which lets you manually adjust video quality – useful when you're on a limited data plan – and turn off auto-play of the next video in a series. And if you're irritated by Netflix's auto-sorting of your My List queue, turn on Manual Ordering (tinyurl.com/k7c2xve) to arrange them by hand.

MINIMISE BUFFERING DELAYS



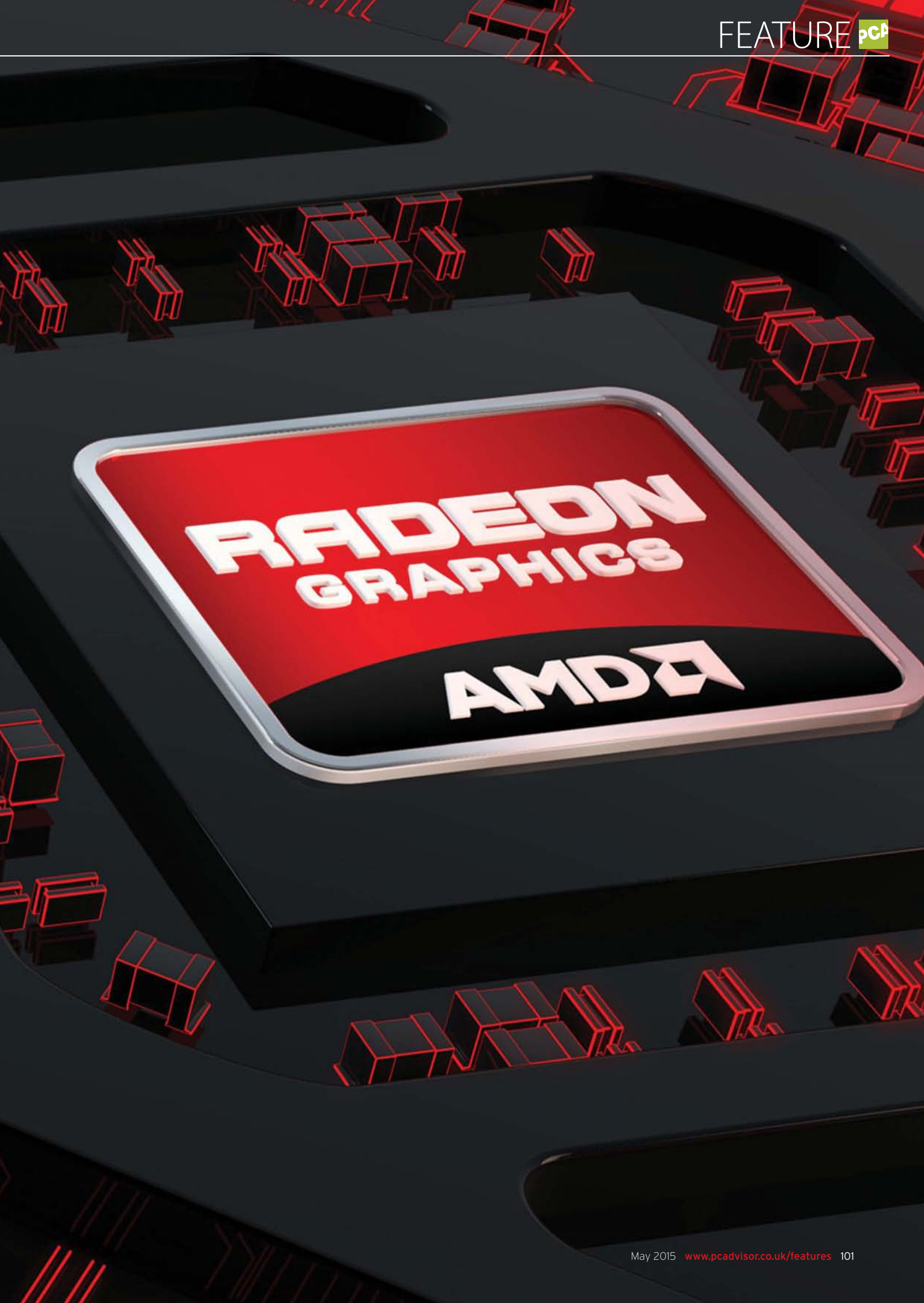
If Netflix keeps hitting you with the dreaded 'buffering' icon, you may be able to trade off some audio and video quality for smoother playback. While streaming, hold down Ctrl-Shift-Alt and press S to bring up the bitrate menu. Select lower numbers for audio and video bitrate to increase the chances of smoother streaming, then click Override. You can get things back to normal by bringing up the menu again and hitting Reset. ☒



FEATURE-STUFFED CATALYST OMEGA REINVENTS AMD'S APPROACH TO GRAPHICS DRIVERS

Catalyst Omega represents an impressive first roll of the dice in AMD's new user-focused game.

By Brad Chacos


RADEON
GRAPHICS
AMD

LET'S BE HONEST:

Most of us don't regularly update our graphics drivers

Okay, maybe you do, Mr Hardcore #PCMasterRace enthusiast, but a vast swathe of gamers fiddle with their graphics drivers only when they absolutely have to – when something breaks or when a new game is acting funky, say. AMD's new Catalyst Omega driver and its underlying philosophy are designed around that prevalent if-it-ain't-broke-don't-fix-it behaviour.

Catalyst Omega marks the beginning of a new driver release schedule for AMD. The usual game updates and bugfix drivers will continue to roll out continuously as before. Going forward, though, AMD plans to carry out a major release brimming with new features once every year to entice even the most stubborn of holdouts into updating their software. Catalyst Omega is just such a goodie-stuffed driver – and it's the start of a new era of quality assurance for the company, according to Robert Hallock, AMD's technical communications lead.

But it also appears to be the potential dawn of a more ominous age for AMD enthusiasts, because the vast majority of Catalyst Omega's new features aren't available for one-generation-old Radeon 7000-series graphics cards, nor even the current-generation R9 280 and R9 280X (which are basically rebrands of the older Radeon 7950 and 7970 – see tinyurl.com/Lg5v337).

When asked whether some of the features might hit Radeon 7000-series cards in the future, Hallock said: "This driver is focused on R9 and R7."

We've been testing the drivers for a couple of weeks now. Let's dig in.

Virtual Super Resolution

As you may have guessed from the name, Virtual Super Resolution is AMD's response to nVidia's Dynamic Super Resolution (tinyurl.com/najv9vb), and it's new in Catalyst Omega. When VSR is enabled, your graphics card will render games at a higher resolution than your monitor natively supports, and then downsample the image to native resolution when it's sent to your monitor. Virtual Super Resolution offers support for resolutions up to full 4K, even if you're using a 1080p monitor.

The technology gives you far smoother edges and textures than you'd see at your monitor's native resolution, as well as a much wider field of view – though that can occasionally wreak some havoc in games with small interface elements, as highlighted in the screenshots below in the AMD-provided comparison of Civilization: Beyond Earth at 1080p with VSR disabled (left) and enabled at 4K resolution (right). Downsampling also negates the need for anti-aliasing.

Actually using AMD's Virtual Super Resolution technology is much more seamless than using nVidia's Digital Super Resolution, in our opinion – at least if you don't let nVidia's software automatically 'optimise' your in-game settings. While nVidia's DSR settings are buried inside its GeForce Experience software, AMD's technology lets you simply select higher-than-native resolutions via in-game options after you've enabled VSR in the Catalyst Control Center.

But only if your system supports it. The first iteration of Virtual Super Resolution requires scaler hardware found only in a handful of graphics cards: the R9 285, R9 290, R9 290X and dual-GPU R9 295X2.

> Virtual Super Resolution technology gives you far smoother edges and textures than you'd see at your monitor's native resolution, as well as a much wider field of view – though that can wreak havoc in games with small interface elements

Sure, the price of Radeon cards has plummeted recently, but those models are still at the beefier end of the spectrum. Fear not, though, budget gamers. AMD hopes to release a driver that enables VSR in the rest of the R-series line-up using software tricks sometime in early 2015 – which, admittedly, takes some of the shine off Catalyst Omega's 'ONE DRIVER PER YEAR' pitch.

It's also hard not to feel a bit disappointed that this feature is limited to current-generation Radeon hardware alone, as nVidia rolled DSR out to GTX 500, 600 and 700-series cards after establishing it in the new GTX 970 and 980.

VIRTUAL SUPER RESOLUTION IN ACTION



THE FIRST 5K monitor is already here, in the form of Dell's 27in UP2715K

Your monitor's resolution and refresh timing also need to be supported for Virtual Super Resolution to function, though the most common resolutions are. If your monitor doesn't come up to scratch, the option to enable VSR won't even be available in the Catalyst Control Center, as we discovered when we tried using Catalyst Omega with a 30in, 2560x1600 monitor. And full virtual 4K resolution is available only with the R9 285.

It's great to see graphics vendors actively supporting downsampling after years of leaving it to third-party solutions like Peter 'Durante' Thoman's (stellar) GeDoSaTo (tinyurl.com/o5ukeaj). Technologies like Virtual Super Resolution are a smart way to exploit the extra horsepower of modern high-end graphics cards with monitors that gamers actually use – especially when you consider how screen resolutions have been largely stalled for the past decade.

Monitor support

Speaking of displays, Catalyst Omega also enables support for AMD's FreeSync technology. FreeSync is similar (yet again) to nVidia's G-Sync. Both technologies force your graphics card and monitor to synchronise their refresh rates, alleviating the pesky screen tearing and stuttering issues that can pop up under normal circumstances. We've seen nVidia's G-Sync implementation in action, and the result is stunningly smooth.

Catalyst Omega paves the road for AMD's response. The first FreeSync monitors have yet to hit the streets, but Samsung announced FreeSync support for a whole line of 4K displays, and Hallock said that at least three other display vendors will be showing FreeSync-compatible monitors at the CES 2015 show. The initial FreeSync monitors are expected to be released during the course of this year, with Samsung's UD590 and UE850 4K displays appearing in March.

But the first 5K monitor is already here, in the form of Dell's 27in UP2715K. Catalyst Omega includes support for the display and its eye-popping 5120x2880 resolution, although your graphics card will need at least a pair of DisplayPort 1.2 connections to power such a beast of a screen.

If you are running an insanely beefy system, Catalyst Omega boosts AMD's Eyefinity multimonitor support all the way up to a ludicrous 24 simultaneous displays in a quad-GPU setup, along with a tweaked Eyefinity interface. In a word: damn. If you do get a glorious setup like that up and running, be sure to shoot us a picture.



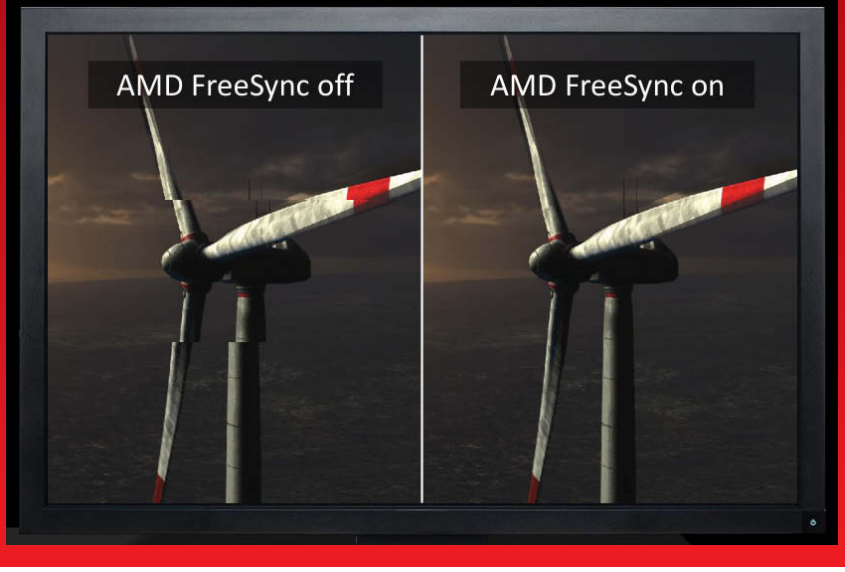
Gaming performance

Catalyst Omega also includes the in-game performance enhancements that are the bread and butter of system graphics drivers, though they're mostly a secondary focus behind the new features and QA enhancements. As Hallock told us: "We're not promising the world here."

Indeed, AMD's supplied performance stats even compare Omega against launch-day Catalyst drivers for APUs and GPUs rather than the most recent drivers. That makes a bizarre sort of sense, though, as Omega is targeted toward people who rarely update their drivers.

AMD APUs – which combine an AMD CPU with Radeon graphics on the same chip – see the biggest benefit here. According to AMD's supplied statistics, several titles see framerate increases in the double-digit

FREESYNC PREVENTS the screen tearing seen when your GPU and monitor refresh at different rates



THE MONITOR RESOLUTIONS and timings that are supported by Virtual Super Resolution, along with the virtual resolutions available on the hardware

Target display timing	Supported VSR mode
1920x1080, 60Hz	2560x1440, 3200x1800 3840x2160 (R9 285 only)
1920x1200, 60Hz	2048x1535, 2560x1600, 3840x2400 (R9 285 only)
2560x1440, 60Hz	3200x1800
1920x1080, 60Hz	1920x1200, 120Hz 2048x1536, 120Hz

percentages compared to the launch-day Catalyst 14.2 driver. We don't have an APU system on hand to test ourselves, so we can't confirm that claim.

You may also see some framerate boosts when you're using discrete Radeon graphics cards, but even AMD's supplied stats – which compare Catalyst Omega against the older Catalyst 13.12 driver – show some modest improvements.

In most of our testing suite – comprising Metro: Last Light Redux, Sleeping Dogs Definitive Edition, Alien: Isolation, Ryse: Son of Rome, and the Unigine Valley and 3DMark 11 Firestrike benchmarking tools – framerate improvements over the Catalyst 14.11 beta drivers were negligible. But Bioshock Infinite's average framerate improved drastically, from 51.4 frames per second to 61.7fps at 2560x1600 resolution, on Ultra settings with Diffusion Depth of Detail enabled.

Another nifty trick up Catalyst Omega's sleeve is that it brings the frame pacing enhancements previously available for multi-graphics card CrossFire setups to AMD Dual Graphics configurations – basically that's AMD's way of referring to an APU paired with a Radeon processor. Better frame pacing means less drastic leaps in minimum/maximum framerate rendering, giving games a far smoother, less jittery feel.

Again, we don't have an APU on hand to test the claim, but AMD's supplied stats from a system pairing an A10-7850K APU with a Radeon R7 250 processor, with both games run on medium graphics settings at 1080p, are shown in the upper screenshot opposite.

Catalyst Omega also includes frame pacing improvements for a handful of memory-intensive games being played in a CrossFire setup: Tomb Raider, Hitman Absolution, Watch Dogs, and Far Cry 3.

Video enhancements

Games aren't the only media to get a boost from Catalyst Omega. The new driver aims to give video playback a boost through several new features, which is great news for folks who tapped AMD's Radeon-bolstered APUs for their home cinema PC.

Contour removal more efficiently removes those blocky little compression artifacts so common in compressed videos. It is supported on 25W or higher APUs and R7 or R9-series Radeon graphics cards only (but not on the Radeon R9 280 or 280X).

1080p detail enhancement hits a similar note, improving the clarity and sharpness of compressed, low-resolution video when you're playing it at 1080p resolution. This technology is supported on AMD 7x00 A-series APUs and only the Radeon R9 285 graphics card, which is powered by AMD's new Tonga GPU. Since the R9 285's GPU is so fresh, presumably this feature will be supported in wider fashion whenever AMD's next-generation R9 300-series graphics cards appear.

FullHD to UltraHD video performs the same action but for beefier hardware, by using processing trickery to improve the clarity of 1080 video when it's blown up on a 4K display. To use it you'll need an AMD 7x00 A-series APU, any R-series Radeon GPU of R7 260 or higher, and, of course, a 4K monitor. It seems a bit odd that this is supported by the R9 280 and 280X but not Radeon 7000-series cards, but that's the way it is.

Finally, fluid motion video "uses GPU compute to interpolate inferred frames with real frames", according to AMD, making playback smoother. Unfortunately, we didn't have a chance to test the tech because it's available only in insanely specific scenarios.

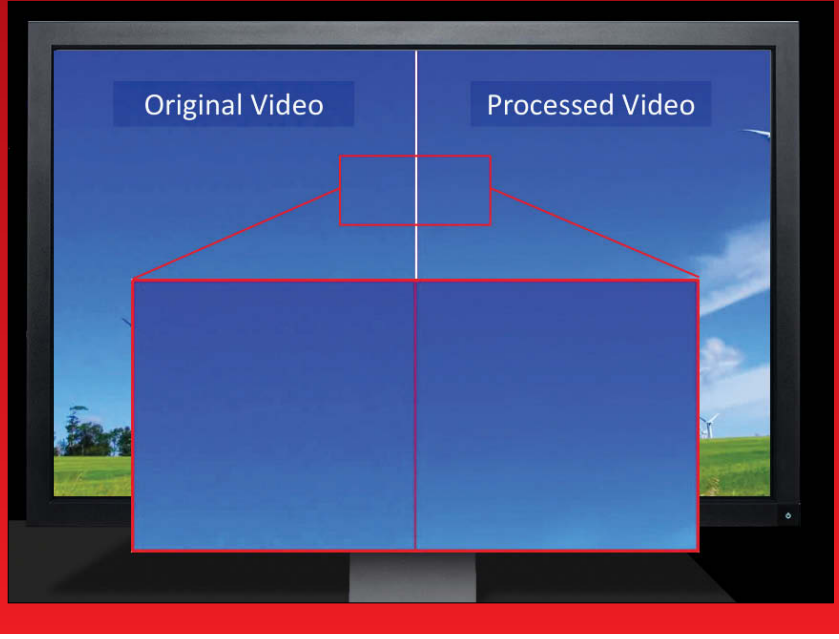
Beyond requiring a 35W or higher AMD 7x00 A-series APU or a Radeon R7 260 or higher R-series graphics card (again, sans the 280X and 280) on the hardware front, fluid motion video works only when you're watching a Blu-ray disc with Cyberlink PowerDVD 14. Even then, you have to enable it manually in the TrueTheater/Hardware Decoding submenu (which is hidden in the Video, Audio, and Subtitles submenu of PowerDVD's Player Settings options) while you're watching a Blu-ray.

> Better frame pacing from Catalyst Omega means less drastic leaps in minimum/maximum framerate rendering, giving games a far smoother, less jittery feel

Quality assurance improvements

We started this article with a call for honesty, and if we're being honest, AMD's drivers have long had a reputation – fair or not – of being

AMD'S CONTOUR REMOVAL compared to a still from a video that hadn't been optimised with the technology



not quite as stable as nVidia's. With Catalyst Omega, AMD has tackled the issue head-on, a fact that Hallock stressed repeatedly.

Compared to previous drivers, AMD performed 65 percent more automated quality assurance testing on Catalyst Omega. The company also engaged in rigorous internal 'dogfooding' of the driver, performing 12 percent more manual testing on Catalyst Omega, across 10 percent more system configurations and 10 percent more display types.

All told, Hallock said the development team engaged in hundreds of thousands of tests, which found and fixed several hundred issues before Catalyst Omega's release.

AMD still has a way to go before it wins over sceptical gamers, though. To that end, the company's been actively asking for quality feedback from its users. Catalyst Omega fixes the 10 most devastating driver bugs mentioned by those users. The company's maintaining a dedicated bug report page (tinyurl.com/pqgktoa) and plans to focus on squashing the top community-reported bugs going forward.

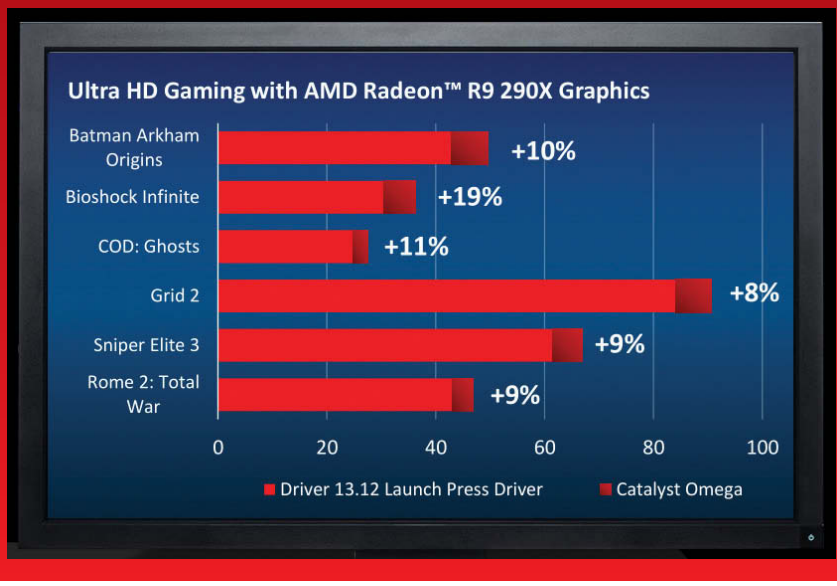
And much, much more

Those are only the key consumer features included in Catalyst Omega. Here are a few more highlights:

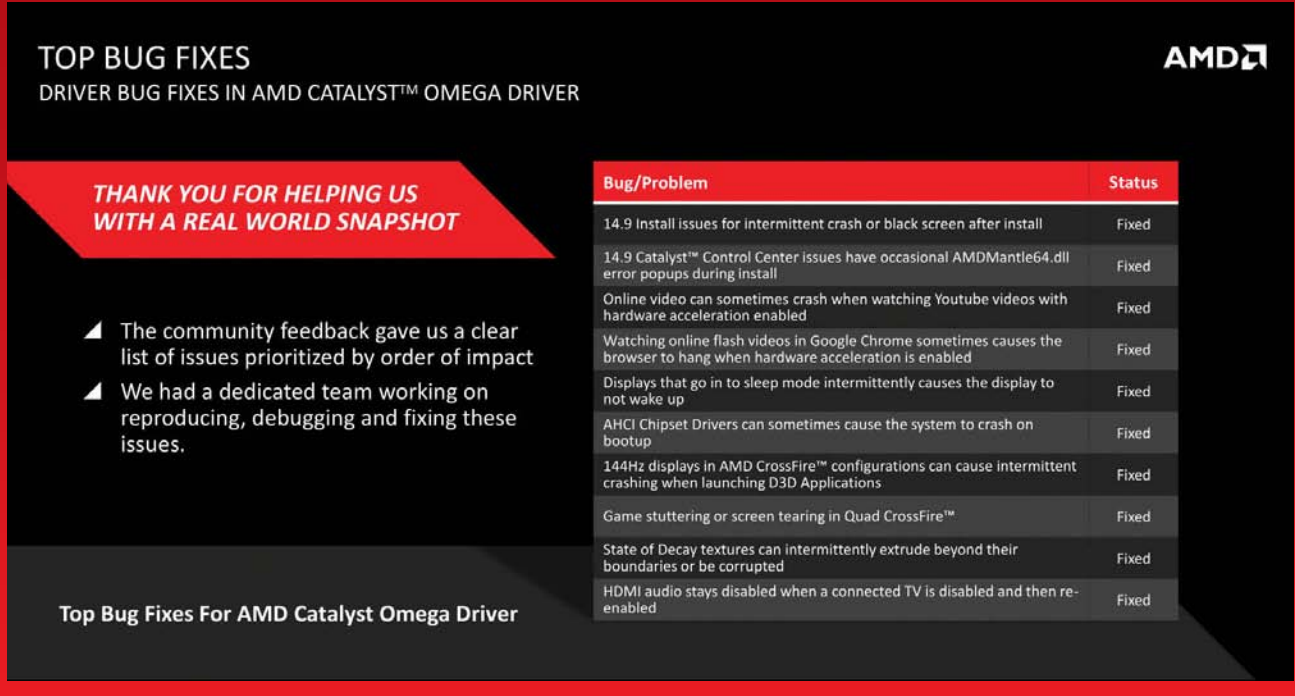
- The hair-enhancing TressFX 3.0 adds support for animal fur.
- AMD's Gaming Evolved client now includes Mantle support for game streaming.
- OpenCL 2.0 and OpenGL ES3.0 are now supported.
- There is AMD CodeXL 1.6 and HSA Runtime support for developers.
- Catalyst packages are available for the Red Hat and Ubuntu Linux distributions.
- Catalyst installation has been streamlined and there is faster hardware detection.

Sure, we're still eagerly awaiting AMD's Radeon hardware response to nVidia's masterful 900-series graphics cards. But the release of Catalyst Omega shows that AMD's still fighting on the software side of things, too. And whenever all those new Radeon R9 300-series graphics cards do start showing up, you can expect them to be taking full advantage of the slew of features buried within this driver. ☒

BIOSHOCK INFINITE'S AVERAGE FRAMERATE improved drastically, leaping from 51.4- to 61.7fps at 2560x1600 resolution, on Ultra settings with Diffusion Depth of Detail enabled



THE COMPANY IS MAINTAINING a dedicated bug report page and plans to focus on squashing the top community-reported bugs going forward




LINKSYS
LINKSYS
POWER
INTERNET
USB 2
1
2
3
4

THREE SECURITY-BOOSTING STEPS TO PERFORM ON EVERY ROUTER

Your router is the very heart of your tech, so it makes sense to give it top-notch protection. By Ian Paul

The computer industry has worked hard to make sure that a lot of the gadgets we use are mostly plug-and-play. In other words, you just fire up the device, log in and you're ready to go – no configuration is necessary. However, there is one device that you should never just stick in and forget all about, and that is your home's network and wireless router.

After the router technician leaves your house there are a few important things everyone should do.

1. Change your router password

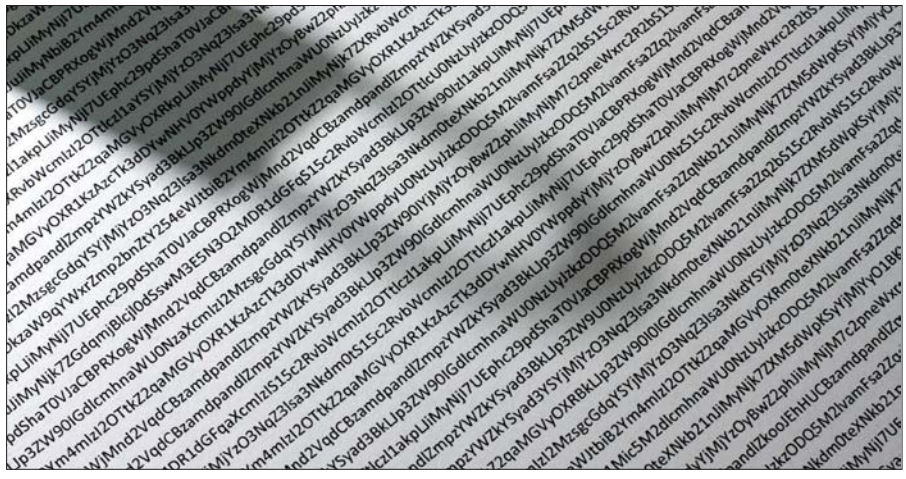
The first thing you should always do when you have a new router is log into its control panel. You should do this so you know how to change the Wi-Fi access password, how to change the type of security protocol your router is using, how to change the router name, and so on. Most importantly of all, you need to log into your router so you can change the admin name and password.

Alas, some routers won't let you change the admin user name, but changing the admin password is the crucial part. If you don't do this and a miscreant gets onto your home network, they can easily log into your control panel and own your router using the device's default settings.

If you don't know how to log into your router, check the manual that came with it, ask your internet service provider, or try to find a user manual for your model online.

2. Use WPA2

Now that you've logged into your router to reset the password, it's time to make sure that you are using WPA2 (Wi-Fi Protected Access II) as the encryption standard for connecting to your router.



Right now, WPA2 is considered the best way to secure your router connection. The standard works by encrypting all traffic between devices and the router, making it much harder for anyone to nab your data as it travels through the air.

One thing you'll also want to do is make sure that Wi-Fi Protected Access (WPA) is disabled. WPA opens up a weakness in your router that could be exploited by a determined attacker.

Your router's encryption protocol settings are often found under the device's Security heading or something similar.

3. Set a horribly long password

Now don't go completely nuts with this one. I'm not suggesting that you use a 100-character password or anything like that, but a password 20 to 30 characters long with randomly generated letters, numbers and special symbols (if allowed) is a pretty solid idea. The point is to make it as hard as possible for an attacker to figure out your password. One easy way to do that is to make this password a little longer than most passwords you use online.

It does mean you should probably use a password manager to remember it, and the occasional need to log new devices onto the network can be a pain. But the extra effort pays off with a more secure password that keeps bad guys off your network.

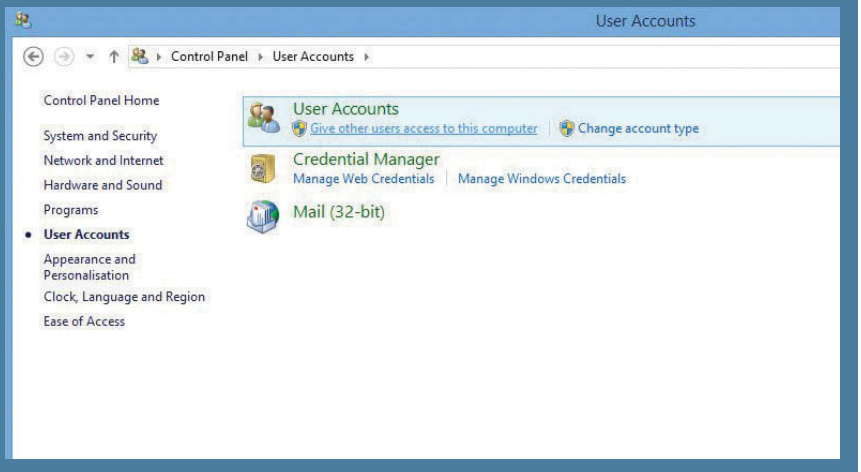
Beyond the basics

Those three steps are just basic things, but once you're inside your router you'll find all kinds of other settings that you could tweak such as changing the Wi-Fi broadcast channel, changing the channel width, adjusting your NAT settings, and configuring port forwarding. Why not take a look? ☒

Create a User Account in Windows 8 and 7



Microsoft's Windows allows users to create User Accounts that tell the operating system which files, folders and programs that person can access, as well as retaining personal preferences such as the particular theme that's being used. Matt Egan explains how to set up a User Account in Windows 8 and 7

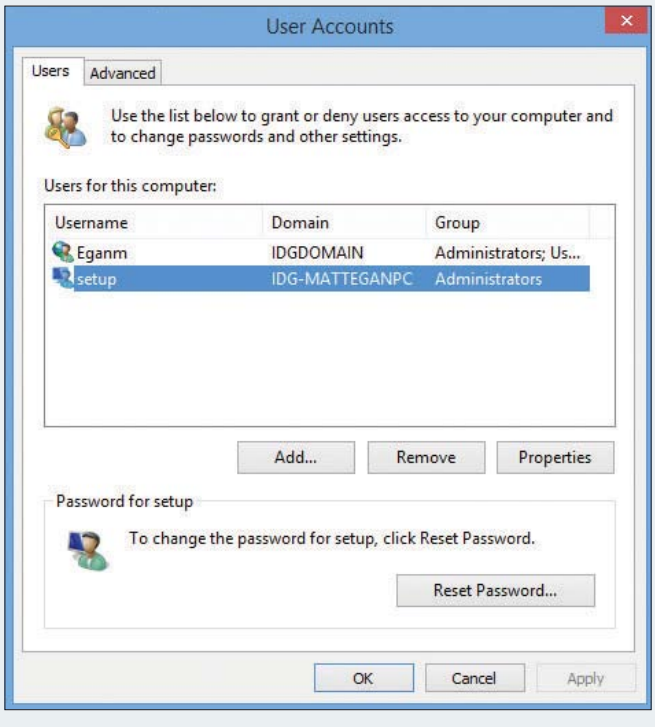


Create a User Account in Windows

From the Start menu, open the Control Panel. In Windows 8, simply use the universal search to find Control Panel. Locate User Accounts and then choose 'Give other users access to this computer' if your machine is on a domain, or 'Manage another account if its on a home network' where no other computer has control over it, or if is a standalone PC. You will be able to see only one of these options.

If you're on a domain, you'll be presented with a list of existing accounts for the PC. Press Add. You'll be asked to enter a User Name and the domain name. Now select whether you want to grant the user a Standard account or an Administrator account. Then press Finish.

Alternatively, if your machine is a standalone system or on a home network, you'll simply need to enter a name for the user and select whether they will be a Standard or Administrator account. Then press Create Account.



While user accounts don't need a password, Microsoft recommends you set one. The user can do this themselves, by logging on to the computer and opening the Control Panel. Select User Accounts and then choose Create a password for your account. Enter the password and then type it a second time to confirm it. You can also add a password hint if required. Then press Create Password.

If the PC is on a domain, the password can only be created by the administrator. Open the Control Panel and Select User Accounts. Choose Manage another account. Select the account you want to create a password for and press Create a password. Type in the password, confirm it and then press Create password.

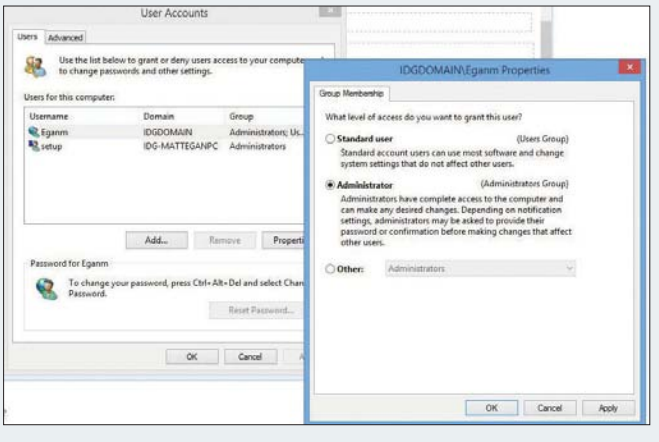
Make a Windows User Account an Admin

Being an Admin allows you to make changes to a computer's setup in a way that a Standard User cannot. And it can be frustrating if you have an account that isn't Admin. So here we will explain how to upgrade your User Account.

To do this, you will need to be signed in with the administrator password. Again, go the Control Panel. Go to User Accounts, and then Change Account Type. You will see a list of all the PC's users.

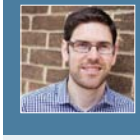
Select the User Account you want to change, and then choose Properties. A new dialog will open up that should offer the options for Standard User, Administrator and Other. Select the Administrator option, hit Apply, and then OK.

Congratulations. You are now an Admin. ☒





Prevent your webcam from being hacked



Chris Martin reveals how to keep your webcam secure from unwanted intrusions

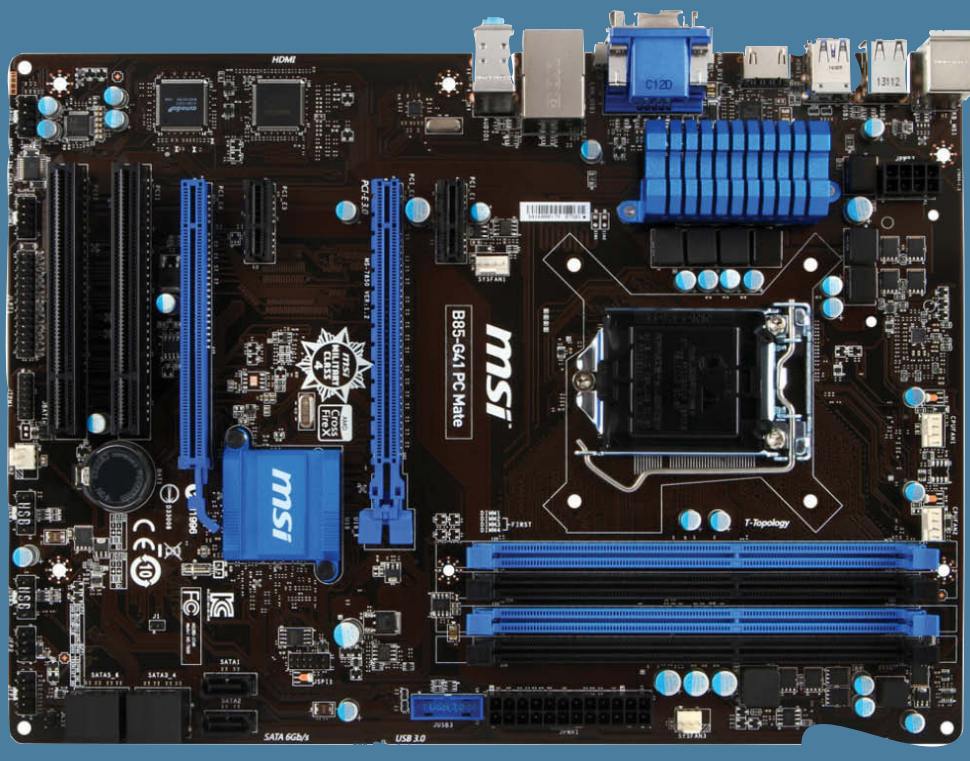
It was well documented last year that the Insecam website was broadcasting feeds from webcams around the world. The site was routing IP streams through its own servers, allowing ads to be served alongside the pictures of whatever the webcams are setup to view. Clicking on an individual stream gave you the IP camera's location, the model, along with the username and password.

Although the site appeared to be a lot of video images quickly replaced by 'broken picture' icons, you may be vulnerable to similar hacks if you have a webcam in your house. We've got you covered, though, and it should be easy to stop this happening.

The main problem was that the hacked webcams were using default and easy to guess usernames and passwords – typically 'admin' and 'password'. Some didn't even require a password.

If you have a webcam and you're worried about it being accessed by an unwelcome third-party, then you should change both the user name and password. You can do this easily with the software supplied with your webcam.

This simple change will stop this kind of exploit but if you're really worried, then you can also stick a piece of tape over the lens when you're not using the device. ☒



Use OC Genie to overclock your computer



OC Genie (now OC Genie II on newer boards) is a fixture on certain MSI motherboards. It is a simple and automatic way to overclock your PC's central processor, RAM, and certain GPUs. In fact, it is probably the easiest-to-use overclocking method – although that does mean the options are somewhat limited.

Rather than requiring the end user to change a BIOS setting or utilise a software application, OC Genie-enabled motherboards come with a physical button that engages instant overclock mode. You can also use the OC Genie function in the BIOS menu, should you so desire.

MSI claims that this tech allows you to improve performance in just one second. It is a conservative way to overclock, but also a safe one. Simply: your CPU's clock rate will jump to 4.2GHz.

Matt Egan looks at how OC Genie can be used to overclock your computer

Is OC Genie safe to use?

Pretty much, yes. Overclocking in itself always carries some risk of long-term damage to your PC's components. In essence your CPU is working faster than – in principle – it was designed to work. This can mean that it wears itself out faster than it ought to. But the type of overclocking enabled by OC Genie is unlikely to cause you any problems.

For one thing there is the relatively conservative nature of what OC Genie can do, coupled with the fact that MSI's tech recognises the components plugged in to the board. OC Genie will not overclock a processor that shouldn't be overclocked.

And there is the other reason that OC Genie is unlikely to destroy your PC: modern Intel Core processors are designed to be overclocked. Any Intel processor that features 'Turbo Boost' is designed to run at a native 3.4GHz, and to be pushed to 3.8GHz when Turbo Boost is enabled. Pushing that chip to 4.2GHz is hardly a great leap. It should improve performance without burning out your chip.

Hardware button

It is really simple: just press the OC Genie button. The OC Genie Processor will automatically detect the best overclocking settings for the CPU, memory and iGPU. This is the way most PC builders and tweakers would use OC Genie to overclock.

In the BIOS

There are two ways to access the BIOS – which is the first software your PC accesses on booting, and therefore the interface via which you can set what is used, at what speeds and in what order. In all PCs up until those manufactured to run Windows 8, you have to press and hold a key during the boot up process. What key that is will display on screen briefly at the top of that process, but is often F2.

In Windows 8 PCs, the process is more simple. The classic way to access the BIOS is to access the PC Settings Charm (hit Windows+C to get up the Charms bar. Go to Update and recovery, and click the Restart now button under Advanced startup. When your computer restarts, you'll enter the Windows 8.1 boot options menu. (An easier way would be to use Windows+Q to get up the search bar and then search for 'Advanced startup'.) Now you can access the UEFI BIOS and change other settings. You have to choose 'Troubleshoot', then 'Advanced options'. Now you should see 'UEFI Firmware Settings'. Click this and you can access the BIOS.

If your PC is built around a motherboard that features OC Genie, you will see the option in the BIOS menu. Select it to use it. ☒

Sideload apps on to an Amazon Fire TV



Installing apps from the Google Play Store can greatly expand your streaming-video catalogue. Jared Newman shows you the tricks to make it work



Amazon's Fire TV and Fire TV Stick offer a beautiful walled garden of content right out of the box, but one of the best things about these media streamers is how easily you can slip beyond the gates.

We recently learned this for ourselves while researching a story on Sling TV, which until recently didn't have a proper Fire TV app. The only way to get it was to sideload the Android phone and tablet version. With a bit more tinkering, we discovered that sideloading opens the Fire TV up to vast quantities of free streaming video and music, far beyond what you get from Amazon's own Appstore. You won't need too much technical know-how, either, although you'll want to have an Android phone handy and a couple quid to spare. Here's how it works:

Setting up sideloading

Start by installing the Amazon Appstore on your Android phone. Go to tinyurl.com/o8nhte3 in your phone's browser and follow the onscreen instructions. You'll likely have to head to Settings > Applications (or Security) and check the Unknown Sources box before you can successfully install the store.

Open the Appstore on your phone, and search for AKG Fire, from developer Gopi Adusumilli. This is a free app that lets you wirelessly sideload any apps from your Android phone, and this is far easier than sideloading through a Windows PC or Mac.

On your Fire TV, head to Settings > System > About > Network and find its IP address. Now, open AKG Fire on your phone (the app name will actually appear as AFTV Side Loader), where you'll be prompted to enter an IP address. Just type in the same address that appears on your Fire TV screen.

All that's left is to choose which apps to sideload. Scroll through your app list in AKG Fire until you find an app you want, then tap on it and select the Install on... option. The install process can take a couple minutes (and there's a pop-up ad you'll have to dismiss), so be patient.

Launching sideloaded Fire TV apps

One problem with sideloaded Fire TV apps is that they don't appear anywhere in the main menu. To find them, you must head to Settings > Applications > Manage All Installed Applications. Click on the app you want, then hit Launch Application.

There is an alternative launcher you can install that will list all your apps in one place, but getting it to open in place of Amazon's default home screen can be unreliable. Besides, you may not want to miss out on using Amazon's interface – which bubbles lots of great Prime content to the surface – so we recommend sticking with the default launcher and dealing with the Settings menu for the handful of apps you plan to sideload.

Touchscreen, meet big screen

Here's the other problem with sideloaded apps: in most cases, they're designed for touchscreens and don't play nicely with the Fire TV remote. Fortunately, the Remote Mouse for Fire TV app gives you all the flexibility of touch controls on the big screen. It's well-worth the money for all the extra video and music you'll be getting.

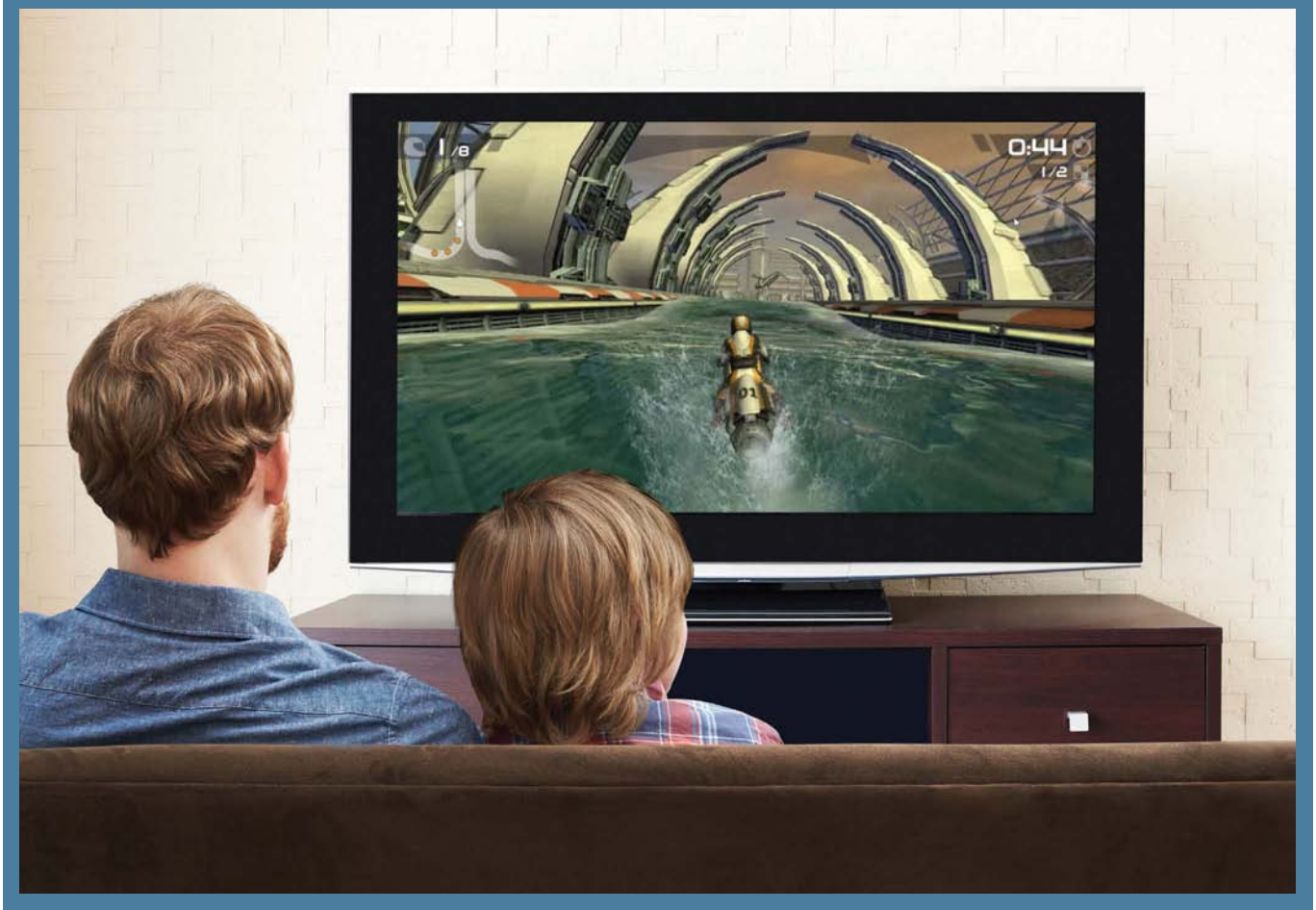
First, install the app on your Fire TV, straight from Amazon's Appstore. You can find it by searching 'Remote Mouse' through the main search box. Open the app, and make sure the options for 'Enable the Remote Service' and 'Auto start on boot up' are turned on. Now, install the app on your phone through the Amazon Appstore.

You'll have to switch to the app's D-Pad mode to get through Amazon's menus, then switch to mouse mode to control your sideloaded apps. Take note of the 's-up' and 's-down' buttons near the bottom of the trackpad area, which allow you to scroll in different directions.

We love how this app is clearly designed for sideloading. If you hit the three-dot menu button in the top-right corner, and then hit apps, it'll take you straight to the section of the Settings menu that has all your sideloaded apps in it.

If you want hardware controls, some users have reported success with the Nyko PlayPad Pro game controller, which has a built-in mouse mode, but we haven't tried this ourselves.

Now that you've unlocked the power of sideloading, what should you do with it? Here are some app suggestions that we've tested ourselves, many of which have full TV episodes that you wouldn't be able to get otherwise: CBS, Comedy Central, Cooking TV, Crunchyroll, Discovery Channel, NBC, Nick, Rdio, Songza, Team Coco, WatchABC and Watch Food Network. ☒



Stream games and video from a PC to a TV



Your TV may be 'smart' and come with fancy features but it probably can't do everything that your PC can do. One example of why you might want to do this is when your TV doesn't offer the catch-up service you want to use. Or, you might want to show holiday photos on the big screen but they're stored on your laptop's hard drive. You might even want to play PC games on your TV, but you don't want a big, noisy PC there in the room.

Chris Martin shows how to connect your computer to your television

Stream from PC to TV using a cable

If you don't mind having your laptop or PC right there next to your TV, the easiest option is to connect the two together with a cable. Most modern TVs and PCs will come with an HDMI port and the chances are you have an HDMI cable lying around ready to go.

Stream from PC to TV wirelessly

If you'd prefer to ditch the wire, another way to stream content from a PC is with a Google Chromecast (tinyurl.com/qbgtcs2). This small gadget costs £30, but you can usually find it cheaper if you search online.

The Chromecast can plug directly into an HDMI port, but it needs power either from the mains or a USB port on your TV. Once set up, you can stream or 'cast' content from devices in your home. The Chromecast works with various iOS and Android apps but you can stream almost anything you want from your PC using the Chrome web browser.

Make sure your PC is connected to the same network as the Chromecast otherwise this won't work. Now open the Google Chrome browser (version 28 or higher) and install the Google Cast Extension. Next, click the Google Cast button in the top right (a rectangle with a Wi-Fi type logo in the corner).

Select your Chromecast from the pop-out box and your TV will now display anything which is shown in your Chrome browser. Select 'cast this tab' to select which Chrome tab you want to stream to the TV. If you want to stream a locally stored video, simply drag and drop it into Chrome.

"The majority of web content can be cast. However, sites that use plug-ins such as Silverlight, QuickTime and VLC are not supported, and may result in a lack of picture or sound," warns Google.

Stream from PC to TV to play games

Streaming games is the toughest challenge as you need not only high-resolution, high-framerate video, but also very little lag. It's no use cracking the first problem only to have the video arrive with a time delay: you'll quickly lose at any multiplayer game.

One solution is NZXT's brand new Doko (see page 45). It uses a wired network connection (via your router) to stream your PC's desktop to your TV. You plug in your keyboard, mouse and game controller to the Doko and install a piece of software on your PC. ☒

Fix battery life following Android 5.0 update



No longer exclusive to the Google Nexus line-up, Android 5.0 Lollipop is rolling out to flagship phones such as the HTC One M8 and Samsung Galaxy S5. Unfortunately, many owners of those devices are now seeing issues with poor battery life that could possibly relate to the Android update. Marie Brewis shows how to get around this



Should I install Android Lollipop?

Before we begin we should point out that not everyone running Android Lollipop is dealing with battery drain – some are happy with the new OS, particularly those with devices that run Lollipop out of the box. (Some are also dealing with Wi-Fi problems but, honestly, there are a lot of happy Lollipop users out there.)

You should also know that every new operating system comes with a few bugs that will be gradually ironed out through updates as they become apparent. There is nothing inherently 'wrong' with Android Lollipop, and we don't know for sure that it is affecting battery life. It has many perks, as you'll learn from our Lollipop review (tinyurl.com/pq823ca), but you should be aware that there may also be a few bugs at first.

Samsung Galaxy S5

We came across a Samsung Galaxy S5 (tinyurl.com/nhdz6od) running Android 5.0 Lollipop on the Vodafone network recently with such poor battery performance that it was down to 95 percent within seconds of unplugging it from the mains. The owner was carrying a spare battery with him at all times, and still he would run out of power by early evening. He also complained that his S5 was running so hot in his pocket that it was burning his leg.

If your battery performance is this bad it's possible that there is something wrong with the battery itself. But the phone was functioning fine until he downloaded the latest Android update, and he is far from alone in reporting battery life issues following the installation of Android 5.0 Lollipop. On checking in the Battery settings what had been using his battery, we found Android OS was greedier than anything else, including the display.

It's not an issue specific to the Samsung Galaxy S5, however, so we expect to hear from more users running into battery life problems as Lollipop continues its rollout.

Android 5.0.1 Lollipop update

Many Google Nexus 5 (tinyurl.com/mmaw8cs) owners who upgraded to Android 5.0 Lollipop at launch were also plagued with battery life issues, although we've seen fewer reports of problems with those phones running the later Android 5.0.1 update which is in essence a collection of bug fixes. Google has also said the problem is fixed in the latest builds. If you haven't received an OTA update to 5.0.1 the file is available from Google.

Unfortunately, this update won't yet be available to owners of Samsung, HTC, Sony, LG or other smartphones, which in the UK are delivered OTA by the network operator, slowing down the process. It could be two months before Samsung releases Android 5.0.1 for the Galaxy S5, for example. Even then, we can't guarantee it will solve battery life problems. So what can you do in the meantime?

How to fix poor battery life

First, check is what is consuming the battery. Open your Settings menu and look for a Battery or Power option; within this you should find Battery usage. Here you'll see battery consumption broken down into the various apps and services running on your phone.

If there is a particular app that is consuming a lot of power – which can be the case with older third-party apps that haven't been optimised for newer OSes – kill it. If things don't improve following its uninstallation then you can always reinstall it.

It's also worth turning off your Wi-Fi when you aren't using it to see if this extends your battery life at all.

Going back to that Galaxy S5 we spoke of earlier, those who have called tech support have been told a factory reset may solve their problem. And in (some) cases it has improved things, but we sympathise with those for whom a factory reset is the last thing they want to do, losing all their personal settings and customisation options in the process. Be sure to back up anything on your phone before you take this step, if you choose to do so.

What can I do to improve battery life?

If all that fails then your only option to solve the problem is to wait for a bug fix to roll out to your phone. But that doesn't help you out in the meantime if your phone is all but unusable. Here are some tips to extend your smartphone's battery life.

- **Restart your phone every so often** Sounds simple, but it could just be the fix you're looking for.
- **Turn down the screen brightness and adjust the screen time-out** You'll find both options in the Settings menu.
- **Turn off Bluetooth and Wi-Fi when not in use** Look for toggles in the notification bar or find these options in the Settings menu.
- **Close apps running in the background** Tap the square button at the bottom of the display to bring up an 'Overview' or recent apps list. Running apps are shown as cards, and you can simply swipe them off the screen to close them.
- **Turn off haptics** Your phone's ability to vibrate to warn you of a new call or notification is useful, but it has to use enough power to make your whole phone shake.
- **Take advantage of power-saving modes** Some phones even have Ultra Power Saving modes that can make 10 percent of the battery's capacity last 24 hours by turning off inessential features.
- **Carry a spare battery or a power bank** Your spare battery offers a single charge for that specific handset, while you can buy a power bank that costs less and offers more charges. ☒



Get WhatsApp on all your devices



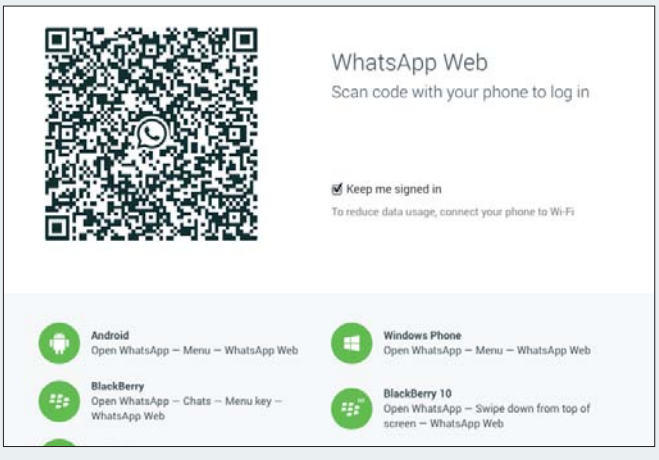
WhatsApp is now available on the web via the Chrome browser, so it's possible to simultaneously access your WhatsApp account on your phone, tablet, laptop and PC without a hack. Marie Brewis explains all

Limitations of WhatsApp on the web

Note that for now WhatsApp on the web works only with Android, BlackBerry, Nokia and Windows phones, not iOS (iPhones, iPads and iPod touch). WhatsApp says this is due to "Apple platform limitations". You must also be using the Google Chrome web browser, and make sure that you are running the latest version of WhatsApp (in Android, launch the Google Play Store, tap the three lines icon at the top left, choose My apps and check whether an update is available for WhatsApp).

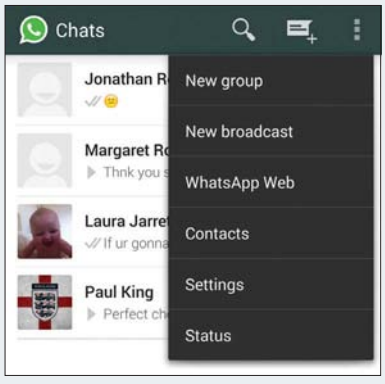
WhatsApp privacy flaw

According to security researcher Indrajeet Bhuyan, a bug within WhatsApp on the web allows complete strangers to view your profile picture even if you have chosen to keep it hidden. He also notes that images are not blurred out in the conversation thread once they have been deleted by the user, suggesting the WhatsApp mobile and desktop platforms are not yet synced correctly.



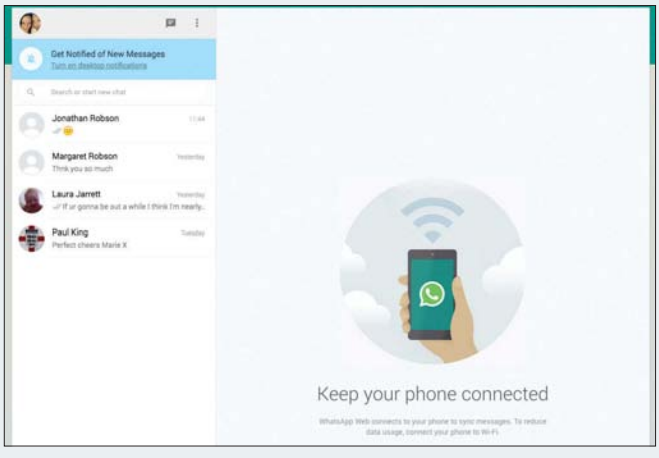
START On your PC or tablet launch the Chrome browser and go to web.whatsapp.com. A QR code will appear – you don't need a QR reader on your phone to read this. If you're using a tablet you'll need to request the desktop site in Chrome's settings.

2 Launch WhatsApp on your phone and click the three dots at the top right to access more options, then choose WhatsApp on the web.



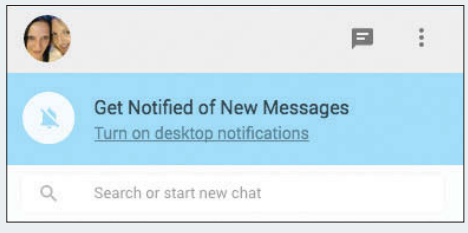
3 A QR reader will then open on your phone; point this at your PC screen to read the code and be automatically logged into WhatsApp on the web.

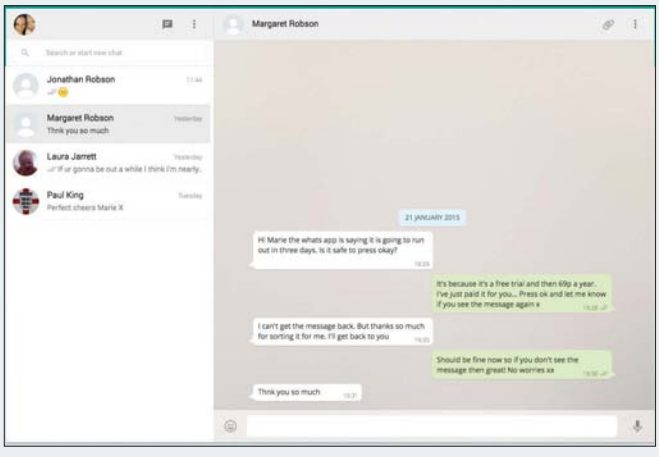




4 The interface will be familiar to WhatsApp phone users, but you should note that desktop notifications are supported. As on the phone, tapping the three-dot icon brings up more options. Select Notifications and then deselect Desktop Alerts and Sounds.

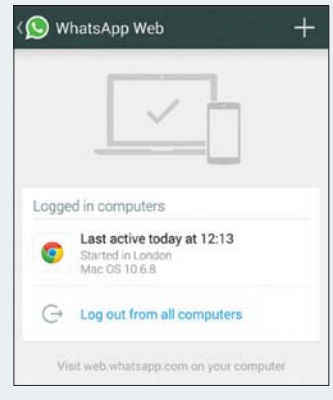
5 Starting a new conversation is slightly different on the desktop. As on the phone you can click the new message icon to select one of your contacts, but in WhatsApp on the web, the search function lets you start new conversations as well as filter existing chats.





6 Within a conversation, the interface matches that of the phone. Beside this is a more options icon that lets you view contact info. And as on the phone you get the single-, twin- and blue-tick system to show whether messages have been sent.

7 Once your phone and computer are connected you are able to manage your logged in computers from your phone via the Options, WhatsApp on the web menu. From here you can log out from all computers, or you can use the options menu in WhatsApp on the web to log out from the PC you're currently using. WhatsApp will by default keep you logged in unless you specify otherwise, but having logged out you'll need to go through the QR code process again the next time you want to log into WhatsApp on that machine.



Messages between phone and browser are instantly synced, so users on limited mobile data contracts should be wary of increased data usage. It's a good idea to switch on your Wi-Fi if you're a heavy WhatsApp user. ☒



Use a selfie stick without a remote control



Some of the cheapest selfie sticks are sold without a remote control or Bluetooth connectivity, but can still take great selfies. Marie Brewis reveals how to use a selfie stick without a remote control

Selfies are the big new thing in the smartphone world, and manufacturers are piling in the megapixels on their phones' front cameras. The HTC Desire Eye (tinyurl.com/nvmmbuf) sitting on the desk in front of me as I type has a 13Mp whopper at the front.

Selfie sticks were an inevitable accessory. They look stupid, sure, but they can help you fit more people in shot for the best groufies, and when held at the right angle they can eliminate the telltale extended arm problem (or 'selfie elbow') as you perfect your pout.

Loads of selfie sticks are available to buy, costing anything from a few pounds to around £50 (read our round-up at tinyurl.com/qcktn26). The idea behind many of them is that they come with a Bluetooth-connected remote control that you use to snap a photo. Some, such as the Olixar Smart Selfie Pole, alternatively come with a built-in shutter button at the bottom of the stick. But what about the very cheapest selfie sticks, which come with neither a remote control nor Bluetooth functionality? Here we explain how to use a selfie stick without a remote control.

Using a self-timer

The best way to take a selfie without touching your screen is to use a self-timer feature. Phones running Android KitKat or later and iOS 8 have this functionality built-in, and you can specify either a three- or 10-second delay. There are also plenty of free apps in Google Play and the App Store that offer self-timer functionality.

The alternative to using a self-timer is to use a gesture (with the arm that's not holding the selfie stick, of course).

Using gestures

If you're an iPhone user you should check out the GoCam app from Crunchfish in the App Store. It's free and lets you capture selfies from up to 10ft away using a simple hand movement. Check out the video below to see how it works. CamMe is a similar app for iOS devices, which takes a photo following a recognised hand gesture.

Some Android phones support gesture-based selfies out of the box. For example, the LG G3 supports Gesture Palm Selfie. For those Android phones that don't support such features, Whistle Camera is an Android alternative that will automatically take a selfie when you whistle and then smile.

Voice commands

Both Android phones and iPhones support the command "Take a selfie" when you call up Google Now or Siri. Unfortunately, doing so merely launches the Camera app, and the need to press the button yourself defeats the purpose of using a selfie stick. ☒



Add an Android phone's contacts to a PC



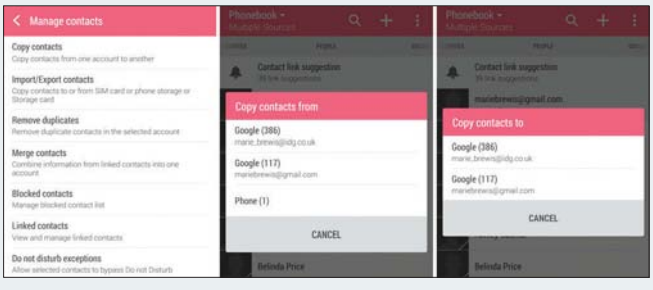
If you lose your phone you needn't lose your friends too. Marie Brewis explains how to access your phone contacts on a PC, laptop or tablet

If saved correctly, any contacts saved on your Android phone are also available to you through a web browser on any PC, laptop, phone or tablet on which you are logged into your Google account. So if you lose or break your phone, you won't lose your friends, too.

When you save contacts to an Android phone, you get the choice of saving them to your SIM card, your phone or to your Google account. With Android, it makes sense to save them to your Google account, since you'll otherwise need to transfer them the next time you upgrade your phone or get a new SIM.

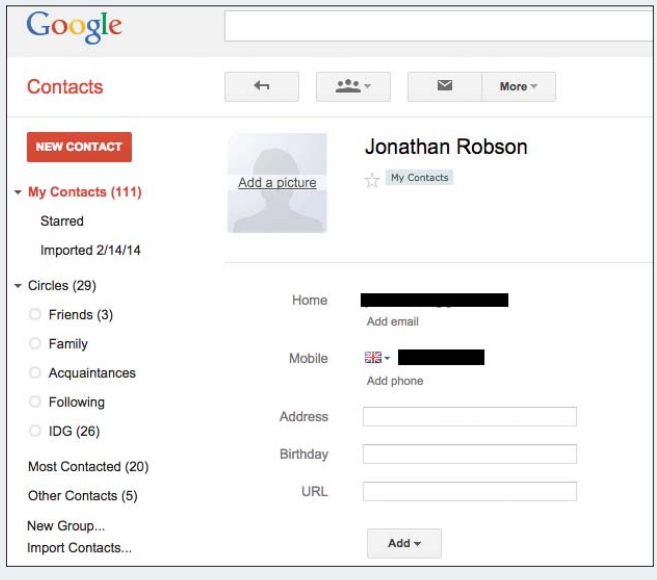
To add new contacts to your Google account, open Settings and choose the People app, then click the Plus sign. Under Contact type choose Google, then fill in the remaining details and click Done.

It's also possible to back up contacts you've already saved to your phone or SIM to your Google account. To do so, open Settings, People and click on the three dots to access more options and choose Manage contacts.

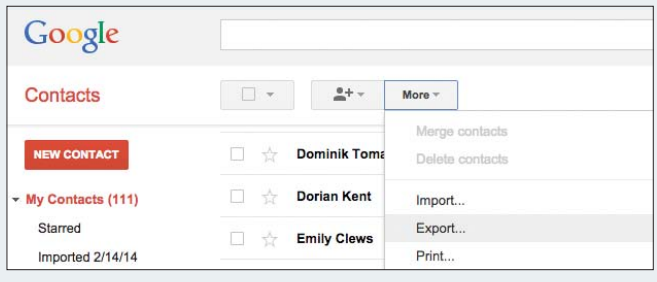


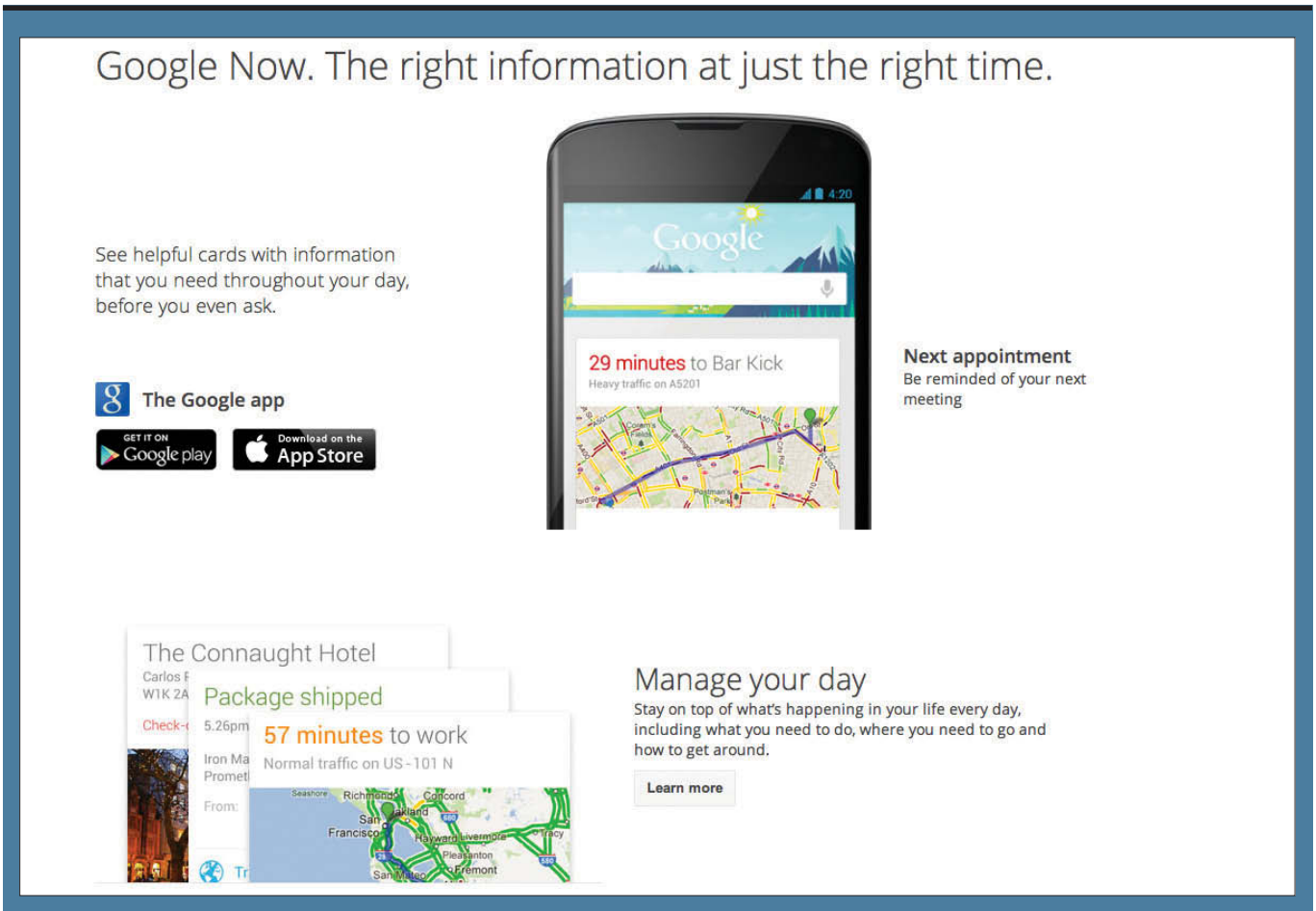
On our HTC Desire Eye (tinyurl.com/nvmmbuf), the top option is to Copy contacts. Tap this, then choose to copy contacts from Phone. You'll then be asked where you'd like to copy the contacts from, so select your Google account.

Now that your contacts are saved to your Google account, you can access them on a PC or laptop browser. Head to google.com/contacts and sign in. You can click on any contact to manage their information, adding a photo, address, birthday, website address and notes, as well as phone numbers and email addresses.



Google Contacts also lets you export any or all of your contacts, either in Google CSV format for importing into another Google account, Outlook CSV format for importing into Outlook or another application, or vCard format for importing into Apple Address Book. To do so, simply select the contacts you want to export and choose More, Export contacts. Now select a format and click Export. ☒





Teach contact names to Google Now



Ben Patterson reveals how to teach Google Now your contact's nicknames

Picking up your phone and saying "Call my dad" or "Call Ted" (meaning Ted your boss, not that random Ted fellow you met five years ago) should work like magic. All too often, though, Google Now (on Android phones) will ask "Who's Dad?" or "Which Ted did you mean?"

Even worse, it might mistake "my dad" for another name in your contact book and start dialling – and at that point, you'll probably be wondering why you didn't skip the fancy voice commands and simply tap your way to your phone favourites.

However, with a little work on your part, you can teach Google the nicknames and relationships of the most important people in your life, from your loving spouse or parents to your closest (or most demanding) colleagues.

Once your phone knows who your dad is – or that "Ted" means your boss, not Ted what's-his-name, using voice commands for phone calls will feel be a lot easier.

Method 1

Of the few different ways to add nicknames and relationships to contacts, the easiest is to tell Google Now via voice command.

Open Google Now (slowly swipe up from the bottom of the screen, or tap the home screen Google search box), tap the microphone icon (or just say "Okay Google" if you've enabled this setting, and say "[name of your spouse] is my [husband or wife]," or "[name] is my [boss]." Assuming it heard you correctly, Google Now will go ahead and assign those labels to the person you named.

Method 2

If you want to add relationships with a bit more precision or give a contact a nickname, you should follow these steps:

First, launch the People app on your Android device, open a contact card, tap the three-dot menu button in the top corner of the screen, then tap Edit. Next, tap Add another field, tap Nickname, then fill in the blank, either with an actual nickname or the contact's relationship to you, such as 'boss' or 'sister'.

If Google Now has trouble with a tongue-twister of a name, select 'Phonetic name' to make voice recognition a little easier.

Method 3

Adding nicknames and relationships from your PC (or Mac) is easy, too. Fire up your favourite web browser, open the Gmail account associated with your Android device, then select Contacts from the pull-down menu in the top-left corner of the page.

Search for and then open the contact you want to edit, tap the Add button at the bottom of the contact card, select 'Relationship', 'Nickname', or 'Phonetic name', and fill in the blanks. ☒

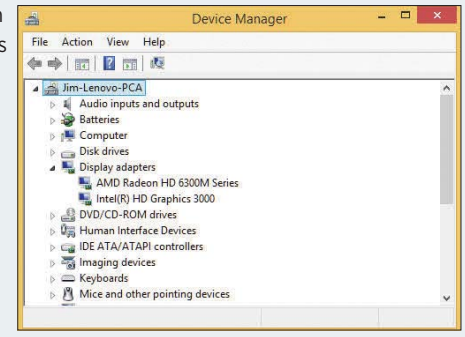
Run a WQHD display from your laptop



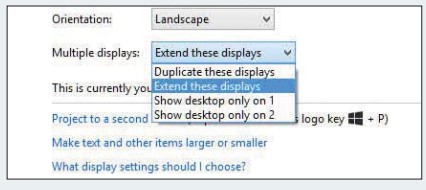
Jim Martin was recently asked how to connect a standard laptop to a monitor with a resolution higher than 1920x1080 over HDMI. Here's how

Your laptop's built-in screen doesn't need to match the pixel resolution of your connected external monitor, but its internal graphics hardware does need to be capable of supporting that resolution. Your laptop's specifications should include details on the maximum resolution of externally connected monitors. Some laptops are limited in terms of external monitor resolutions, while others can cope with displays up to 4K resolution.

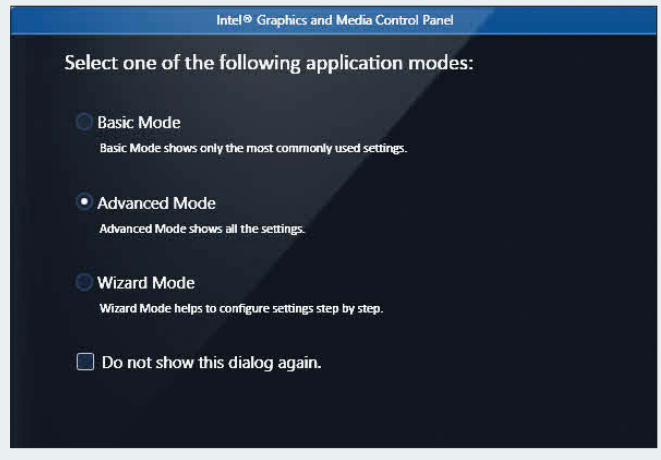
START First, establish which graphics card your laptop has. Go to Control Panel and open Device Manger to find out. Look under Display adaptors and you will see one or possibly two graphics cards. If you have an Intel Graphics 3000, 4000 or Iris Pro 5200 you're in luck. Those with nVidia chipsets should also be able to successfully run 2560x1440. Unfortunately, many AMD graphics adaptors will not support resolutions above 1920x1080.



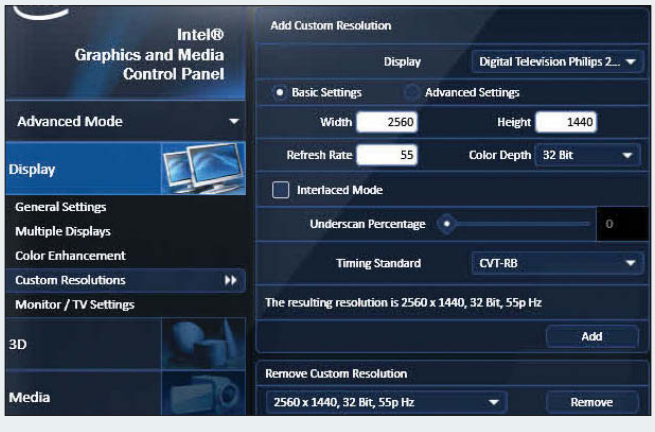
2 Right-click on the Windows desktop and choose Screen resolution. Make sure 'Extend these displays' is selected rather than duplicating the same image on both monitors.



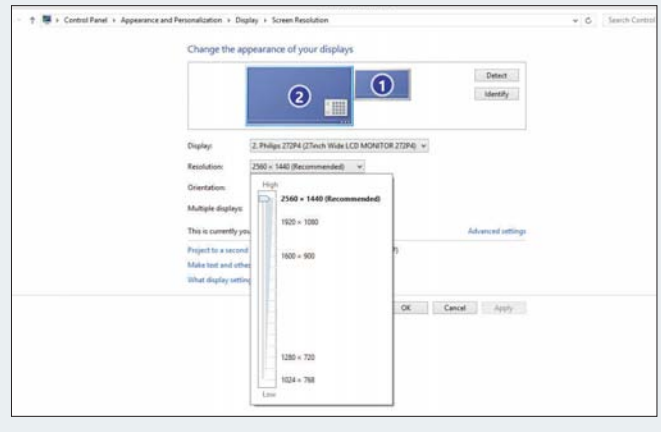
Our laptop has Intel graphics as well as AMD, so we'll use the Intel chip here. The same principles apply to those with nVidia graphics, though. Return to the desktop, right-click it and choose Graphics options. If you don't see this, look in the Start menu to find the Intel utility. If you still don't see it, it may not be installed, so be sure to install the latest Intel drivers from your laptop manufacturer's website.



3 You'll need to be in Advanced mode, so choose that when prompted, or look for a way to switch from basic to advanced in the Intel utility. Now, under Display, on the left-hand side, click Custom Resolutions.



4 Enter the resolution and set the refresh rate to 55. You can try 60, but if you see flickering, step it down to 55Hz. For the timing standard, you can try the default of GTF, but we found that CVT-RB (reduced black) was necessary to make a Philips 272PQ4 work on a Lenovo G570 laptop.



5 Click the Add button, then close the utility. You may need to reboot your laptop to see the new resolution appear in the list, but we found that repeating Step 2 at this point (under Windows 8.1) showed up the new resolution without a reboot. ☒



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iolo System Mechanic 14

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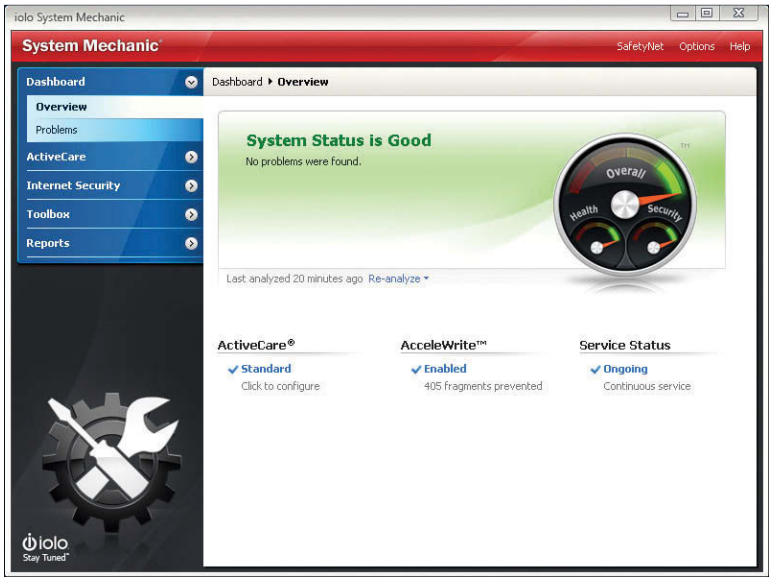
Go to My Computer, right-click the DVD icon and open the disc. Select Files 238/iolo System Mechanic 14 and open the install file.

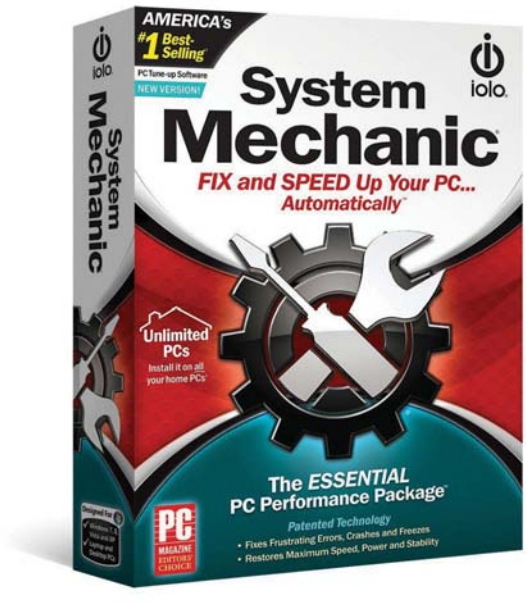
Online registration required: Follow the instructions within the program by 14 May 2015.

System requirements

Windows 2000/XP/Vista/7/8; 200MHz processor; 512MB RAM; 140MB drive space; internet connection

System Mechanic uses patented technology to restore speed, power and stability to your PC. It fixes errors, boosts performance, defends against infections, and proactively prevents problems from reoccurring. This all-in-one solution for complete PC optimization also provides online backup, recovers deleted files, securely wipes data, and includes high-performance triple-certified antivirus protection that won't slow you down. Version 14 contains new technologies that can protect your PC from stability threats more precisely and intelligently than ever before. These include:





New LiveBoost Technology

The ability of a PC to respond quickly to the operating system and the programs it runs is based on a critical triangle of components: the Central Processing Unit (CPU), RAM and the storage drive. If any of these are compromised, the entire performance chain is affected.

New OptiCore

This maximizes CPU power for important tasks and intensive operations such as video, graphics and hardcore multitasking. Most programs aren't designed to share resources, even if they're running in the background. Some apps tend to consume so much CPU power that you can't use your PC for anything else while they're running. OptiCore prevents low-priority programs from creating lags and freezes when more important tasks need to get done. It's optimized for single-, dual-, quad-, 6- and 8-core PC,s and reduces lag on Windows 8, 7, Vista and XP.

New RAMJet

Automatically maximizes available memory when you need it most. Many programs forget to release memory they've reserved but are no longer using, artificially lowering your available RAM and starving foreground apps from the resources they need to run responsively. This can impact the operating system's ability to serve your needs and prevent slowdowns, and the more you multitask the worse it can get. RAMJet automatically recovers trapped memory in real time to help your PC stay at the top of its game.

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Optimizes file organization on both solid-state drives and hard disk drives. Working deep inside the Windows operating system, AcceleWrite increases the efficiency of how files are written to the drive.

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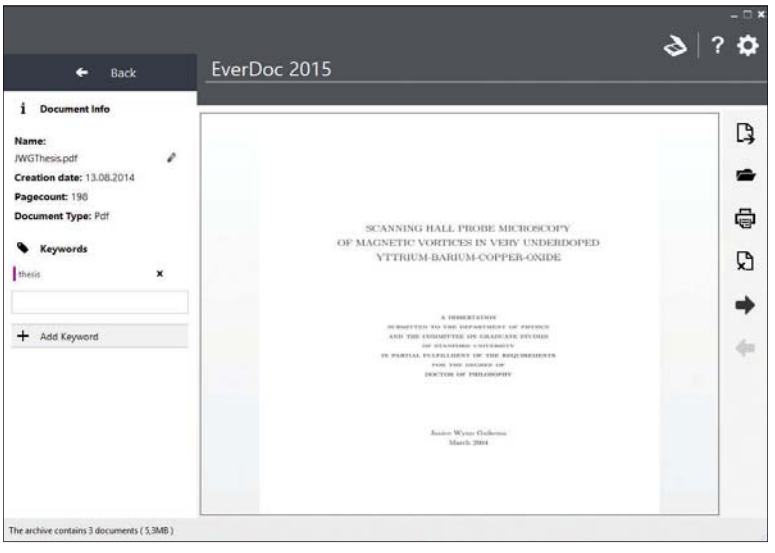
Go to My Computer. Right-click the disc icon and open the disc. Select 238\Abelssoft EverDoc 2015 and open the install file.

Online registration required: Follow the instructions within the program by 14 May 2015.

System requirements
Windows XP/Vista/7/8; 512MB RAM ; 70MB drive space; 1GHz processor

These days, more and more documents are sent to us in digital form such as PDF files or Word documents. However, finding them when they are needed can be tricky. That's where EverDoc comes in. This clever application helps you create your own digital document archive.

The software manages your documents in a convenient and comfortable way, regardless of type: PDF, picture or email. Print out a document and EverDoc will archive it automatically, without bothering you. Or you can add your documents in any picture format. The integrated OCR is able to read the contents of these images. Managing documents will never be easier.



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Our tip: Want to lower your printing costs or live completely paperless? Save your documents directly to EverDoc without printing at all.



Incomedia WebSite X5 Home 11

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Installation details

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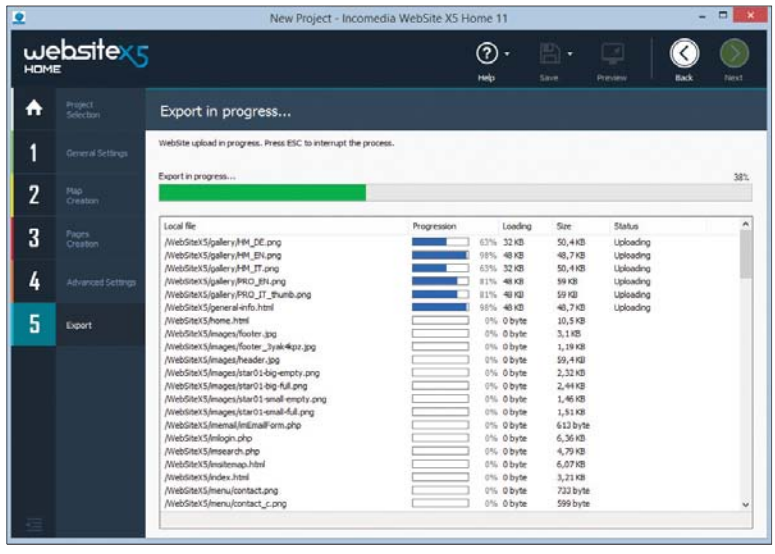
System requirements

Windows XP/Vista/7; 1GB RAM; 1024x768 screen resolution; internet connection

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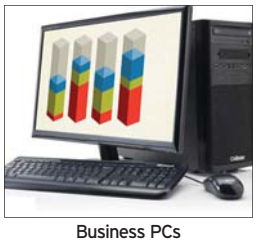

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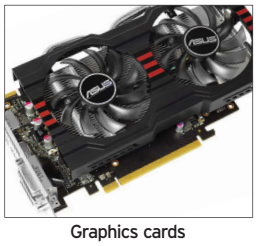

Wireless routers


Printers


Projectors



Solid-state drives


Graphics cards


Flat-panel displays

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Prices

Laptops
Laptops up to £500
£501 to £1,000
£1,001 and over

Printers
Printers under £150
£151 and over

Graphics cards
Graphics cards under £150
£151 and over

Flat-panels
Flat-panels under £200
£201 and over

Prices listed are those quoted by the distributor or manufacturer and include VAT. They are intended only as a guide and you may see products on sale for less or more than our quoted price.

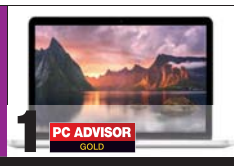
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Ultraportable laptops











	Apple MacBook Pro 13in Retina	Apple MacBook Air 13in	HP Spectre 13-3010ea	Toshiba Kira-101	MSI GS60 2PE Ghost Pro
Price	**£1,399 inc VAT**	**£849 inc VAT**	**£999 inc VAT**	**£1,299 inc VAT**	**£1,360 inc VAT**
Website	Apple.com/uk	Apple.com/uk	Hp.com/uk	Toshiba.co.uk	Uk.msi.com
Launch date	July 14	Apr 14	Sep 14	Aug 14	Dec 14
Build rating	★★★★★	★★★★½	★★★★½	★★★★½	★★★½☆
Features rating	★★★★½	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★½☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★½	★★★★☆	★★★½☆	★★★★☆
Overall rating	★★★★½	★★★★½	★★★★☆	★★★★☆	★★★★☆
Processor	2.8GHz Intel Core i5	1.4GHz Intel Core i5	1.6GHz Intel Core i5-4200U	1.8GHz Intel Core i7-4500U	2.4GHz Intel Core i7-4700HQ
RAM	8GB DDR3L	4GB DDR3L	8GB DDR3	8GB DDR3	8GB DDR3
Storage	512GB SSD	128GB SSD	256GB SSD	256GB SSD	2x 128GB SSD, 1TB HDD
Screen size	13.3in glossy (anti-glare)	13.3in glossy (anti-glare)	13.3in glossy	13.3in glossy	15.6in matt
Screen resolution	2560x1600	1440x900	1920x1080	2560x1440	1920x1080
Graphics	Intel Iris Graphics	Intel HD Graphics 5000	Intel HD Graphics 4400	Intel HD Graphics 4400	nVidia GeForce GTX 870M
Video memory	N/A	N/A	N/A	N/A	3GB
Wireless	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11b/g/n/ac	802.11a/b/g/n/ac
Ethernet	Optional	Optional	None	None	None (mini)
Bluetooth	✓	✓	✓	✓	✓
USB	2x USB 3.0	2x USB 3.0	2x USB 3.0	3x USB 3.0	3x USB 3.0
FireWire	×	×	×	×	×
Thunderbolt	2x	✓	×	×	×
DisplayPort	×	✓	✓	×	✓ (mini)
HDMI	✓	×	✓	✓	✓
DVI	×	×	×	×	×
VGA	×	×	×	×	×
eSATA	×	×	×	×	×
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	N/A	N/A	N/A	N/A	N/A
Extras	FaceTime HD webcam	HD webcam, multitouch trackpad, backlit keyboard	1080p webcam	720p webcam	720p webcam
Operating system	Mac OS X 10.10 Yosemite	Mac OS X 10.10 Yosemite	Windows 8.1 64-bit	Windows 8.1 Pro 64-bit	Windows 8.1 64-bit
Bundled software	iLife 11	iLife 11	None	None	None
Fear (Max detail)	Not tested	Not tested	31fps in Stalker (720p)	17fps (1080p)	45fps Batman: Arkham City
Battery	71.8Wh lithium-polymer	54Wh lithium-polymer	51Wh lithium-ion	52Wh lithium-polymer	52Wh lithium-polymer
Battery life	9 hrs 55 mins	12 hrs 57 mins	7 hrs 30 mins	7 hrs 10 mins	1 hr 59 mins
PC Mark 7 score	Not tested	4602	5006	5100	5655
Dimensions	314x219x18mm	325x227x4-17.5mm	324x220x15mm	316x207x19.8mm	390x266x19mm
Weight	1.57kg	1.35kg	1.52kg	1.26kg	1.9kg
Warranty	1 year return-to-base	1-year return-to-base	2 year return-to-base	2-year onsite	2-year onsite
FULL REVIEW	TINYURL.COM/PNTUMPW	TINYURL.COM/KNXWZW3	TINYURL.COM/N4CJQL9	TINYURL.COM/QHP9F9T	TINYURL.COM/JVJBU39

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Sub-£500 laptops





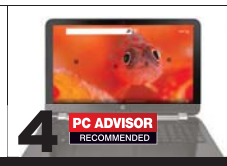






	Lenovo IdeaPad Z50-70	Dell Chromebook 11	Acer Aspire V13	HP 255 G3	Lenovo B50-30
Price	**£399 inc VAT**	**£239 inc VAT**	**£410 inc VAT**	**£210 inc VAT**	**£200 inc VAT**
Website	Lenovo.com/uk	Dell.co.uk	Acer.co.uk	Hp.com/uk	Lenovo.com/uk
Launch date	Jan 15	Dec 14	Jan 15	Jan 15	Jan 15
Build rating	★★★½☆	★★★★☆	★★★☆☆	★★★☆☆	★★★☆☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★½☆	★★★½☆
Performance rating	★★★½☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★½☆	★★★★☆	★★★★☆	★★★☆☆	★★☆☆☆
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★½☆	★★★½☆
Processor	1.7GHz Intel Core i3-4010U	1.4GHz Intel Celeron 2955U	2GHz Intel Core i3-4158U	1.5GHz AMD A4-5000 (4C)	2.16GHz Intel Celeron
RAM	4GB DDR3	4GB DDR3	4GB DDR3	4GB DDR3	4GB DDR3
Storage	1TB HDD	16GB SSD	500GB HDD with 8GB flash	500GB HDD	500GB HDD
Screen size	15.6in gloss	11.6in glossy	13.3in matt	15.6in matt	15.6in matt
Screen resolution	1920x1080	1366x768	1366x768	1366x768	1366x768
Graphics	nVidia GeForce 820M	Intel HD Graphics	Intel Iris Graphics 5100	AMD Radeon 8330	Intel HD Graphics
Video memory	2GB	N/A	N/A	N/A	N/A
Wireless	802.11b/g/n	802.11a/b/g/n	802.11a/b/g/n	802.11b/g/n	802.11b/g/n
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	1x USB 3.0, 2x USB 2.0	2x USB 3.0	1x USB 3.0, 1x USB 2.0	1x USB 3.0, 2x USB 2.0	1x USB 3.0, 2x USB 2.0
FireWire	×	×	×	×	×
Thunderbolt	×	×	×	×	×
DisplayPort	×	×	×	×	×
HDMI	✓	×	✓	✓	✓
DVI	×	×	×	×	×
VGA	✓	×	×	✓	✓
eSATA	×	×	×	×	×
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone minijack	Headphone minijack	Headphone minijack	Headphone minijack	Headphone minijack
Optical drive	DVD Writer	None	None	DVD Writer	DVD Writer
Extras	None	Webcam	None	None	None
Operating system	Windows 8.1	Google Chrome OS	Windows 8.1	Windows 8.1	Windows 8.1
Bundled software	None	None	None	None	None
Battery	41Wh Lithium-ion	Lithium	48Wh Lithium-ion	32Wh Lithium-ion	32Wh Lithium-ion
Battery life	4 hrs 58 mins	7 hrs 17 mins	6 hrs 35 mins	3 hrs 58 mins	4 hrs 51 mins
PC Mark 8 Home score	1959	N/A	2358 (3396 Work)	1646 (2266 Work)	N/A
Batman (Low/High)	33/29fps	N/A	29/24fps	23/20fps	N/A/8fps
Dimensions	382x265x27.5mm	295x201x24mm	327x227x20.6mm	377x257x26.5mm	380x260x26.5-32.5mm
Weight	2.4kg	1.3kg	1.5kg	2.1kg	2.2kg
Warranty	1-year return-to-base	1-year depot	1-year return-to-base?	1-year return-to-base	1-year return-to-base
FULL REVIEW	TINYURL.COM/NJNNKWQ	TINYURL.COM/M3D3QJ4	TINYURL.COM/MF4SHUZ	TINYURL.COM/NBUL2NO	TINYURL.COM/OQ94SKB

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£501-£1,000 laptops	 1 PC ADVISOR RECOMMENDED	 2	 3	 4 PC ADVISOR RECOMMENDED	 5
	Scan 3XS Graphite LG156	**Dell Inspiron 17-7000**	**Chillblast Defiant 2 Mini**	**HP Pavilion TouchSmart 15**	**Chillblast Helium**
Price	**£899 inc VAT**	**£799 inc VAT**	**£899 inc VAT**	**£500 inc VAT**	**£899 inc VAT**
Website	3xs.scan.co.uk	Dell.co.uk	Chillblast.com	Hp.com/uk	Chillblast.com
Launch date	Jul 14	Jul 14	Jul 14	May 14	Jul 14
Build rating	★★★★☆	★★★★½	★★★★☆	★★★★☆	★★★½☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★½☆	★★★½☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★½☆	★★★★☆
Value rating	★★★★½	★★★★☆	★★★★½	★★★★☆	★★★★☆
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	2.5GHz Intel Core i7-4710MQ	2GHz Intel Core i7-4510U	2.5GHz Intel Core i7-4710MQ	1.6GHz Intel Core i5-4200U	1.8GHz Intel Core i7-4500U
RAM	8GB DDR3	16GB DDR3	8GB DDR3	8GB DDR3	16GB DDR3
Storage	1TB SSHD	500GB HDD + 8GB NAND	1TB SSHD	750GB HDD	500GB HDD + 120GB SSD
Screen size	15.6in matt	17.3in glossy	13.3in non-reflective	15.6in glossy touchscreen	14in
Screen resolution	1920x1080	1920x1080	1920x1080	1366x768	1600x900
Graphics	GTX 860M/Intel HD 4600	GT 750M/Intel HD 4400	GTX 860M/Intel HD 4600	GT 740M/Intel HD 4400	Intel HD Graphics 4400
Video memory	2GB	2GB	2GB	N/A	N/A
Wireless	802.11a/b/g/n/ac	802.11a/b/g/n	802.11a/b/g/n	802.11b/g/n	802.11b/g/n
Ethernet	Gigabit	Gigabit	Gigabit	10/100	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	3x USB 3.0, 1x USB 2.0	4x USB 3.0	2x USB 3.0	2x USB 3.0, 1x USB 2.0	2x USB 3.0
FireWire	×	×	×	×	×
Thunderbolt	×	×	×	×	×
DisplayPort	×	×	×	×	×
HDMI	✓	✓	✓	✓	✓
DVI	×	×	×	×	×
VGA	✓	✓	✓	✓	✓
eSATA	✓ (shared USB 3.0)	×	×	×	×
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	N/A	N/A	N/A	8x DVD±RW	N/A
Extras	1080p webcam	720p webcam	1080p webcam	Webcam	720p webcam
Operating system	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8 64-bit	Windows 8.1 64-bit
Bundled software	None	None	None	None	None
Stalker (720p/1080p)	178/102fps	104/63fps	180/100fps	60fps (720)	29fps (720p)
Battery	77Wh lithium-ion	58Wh lithium-ion	62.2Wh lithium-ion	41Wh lithium-ion	44.6Wh lithium-ion
Battery life	4 hours	5 hrs	5 hrs 33 mins	5 hrs 45 mins	5 hrs 20 mins
PCMark 7 score	4846	4260	4456	2860	5100
Dimensions	374x250x43mm	412x269x28mm	330x227x32mm	386x258x25mm	337x236x21mm
Weight	2.7kg	3.3kg	2.1kg	2.6kg	2.1kg
Warranty	2-year return-to-base	1-year collect-and-return	2-year collect-and-return	1-year return-to-base	1-year return-to-base
FULL REVIEW	TINYURL.COM/MYTG9X5	TINYURL.COM/N6828JG	TINYURL.COM/NNDFZRR	TINYURL.COM/L2JAXH7	TINYURL.COM/P7U28WQ

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£1,001+ laptops	1 PC ADVISOR BEST BUY	2	3	4	5
	 Aorus X7 v2	 Aorus X3 Plus	 MSI GE70 2PE Apache Pro	 Schenker XMG P304	 Dell XPS 15
Price	**£1,720 inc VAT**	**£1,530 inc VAT**	**£1,100 inc VAT**	**£1,100 inc VAT**	**£1,449 inc VAT**
Website	Aorus.com	Aorus.com	UK.msi.com	Mysn.co.uk	Dell.co.uk
Launch date	Sep 14	Nov 14	Sep 14	Jul 14	Sep 14
Build rating	★★★★☆	★★★★☆	★★★½☆	★★★★☆	★★★★½
Features rating	★★★★½	★★★★½	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★½	★★★★½	★★★★☆	★★★★½	★★★★½
Value rating	★★★½☆	★★★½☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★½	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	2.4GHz Intel Core i7-4860HQ	2.4GHz Intel Core i7-4860HQ	2.5GHz Intel Core i7-4710HQ	2.2GHz Intel Core i7-4702MQ	2.3GHz Intel Core i7-4712HQ
RAM	16GB DDR3	16GB DDR3	16GB DDR3	8GB DDR3	16GB DDR3
Storage	1TB HDD, 3x 128GB SSD	2x 128GB SSD	1TB HDD, 2x 128GB SSD	250GB SSD	512GB SSD
Screen size	17.3in matt	14in matt	17.3in matt	13.3in matt	15.6in gloss
Screen resolution	1920x1080	3200x1800	1920x1080	1920x1080	3200x1800
Graphics	2x nVidia GeForce GTX 860M	nVidia GeForce GTX 870M	nVidia GeForce GTX 860M	nVidia GeForce GTX 860M	nVidia GeForce GT 750M
Video memory	8GB	6GB	2GB	2GB	2GB
Wireless	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11b/g/n/ac	802.11b/g/n/ac	802.11b/g/n/ac
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	×
Bluetooth	✓	✓	✓	✓	✓
USB	3x USB 3.0, 2x USB 2.0	2x USB 3.0, 1x USB 2.0	2x USB 3.0, 2x USB 2.0	3x USB 3.0, 1x USB 2.0	3x USB 3.0, 1x USB 2.0
FireWire	×	×	×	×	×
Thunderbolt	×	×	×	×	×
DisplayPort	✓	✓	×	×	✓
HDMI	✓	✓	✓	✓	✓
DVI	×	×	×	×	×
VGA	✓	×	✓	×	✓
eSATA	×	×	×	✓	×
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	N/A	N/A	N/A	None	N/A
Extras	HD webcam	HD webcam	HD webcam	720p webcam	720p webcam
Operating system	Windows 8.1 64-bit	Windows 8.1 64bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit
Bundled software	None	None	None	None	None
Stalker (720p/1080p)	189/157fps in Tomb Raider	60.9/38.3fps in Tomb Raider	120fps in Batman (1080p)	115fps (1080p)	68fps (1080)
Battery	74.7Wh lithium-polymer	73.26Wh lithium-polymer	49Wh lithium-ion	62Wh lithium-ion	91Wh lithium-ion
Battery life	1 hr 48 mins	1 hr 48 mins	2 hrs	5 hrs 5 mins	5 hrs
PCMark7 score	6304	6627	6241	5500	5833
Dimensions	425x303x24.5mm	330x263.5x22.9mm	418x269x39mm	374x250x37mm	372x254x18mm
Weight	3.24kg	1.8kg	3kg	2kg	2kg
Warranty	2-year return-to-base	2-year return-to-base	2-year return-to-base	2-year collect-and-return	1-year next day in-home
FULL REVIEW	TINYURL.COM/KLUXLGE	TINYURL.COM/LS86960	TINYURL.COM/PU5L5GK	TINYURL.COM/Q4JWVSM	TINYURL.COM/N9GRT4U

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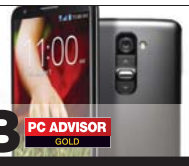
Tablets

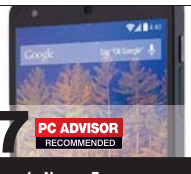
	1 PC ADVISOR GOLD	2 PC ADVISOR GOLD	3 PC ADVISOR RECOMMENDED	4 PC ADVISOR RECOMMENDED	5 PC ADVISOR RECOMMENDED
	Google Nexus 7 (2013)	**Apple iPad Air 2**	**Samsung Galaxy Tab S 8.4**	**Sony Xperia Z3 Tablet**	**Apple iPad mini 2**
Price	**£199 inc VAT**	**£399 inc VAT**	**£319 inc VAT**	**£300 inc VAT**	**£239 inc VAT**
Website	Play.google.com	Apple.com/uk	Samsung.com/uk	Sony.co.uk	Apple.com/uk
Launch date	Jul 13	Oct 14	Aug 14	Jan 15	Oct 13
Overall rating	★★★★½	★★★★½	★★★★½	★★★★½	★★★★½
Platform	Android 4.3 Jelly Bean	Apple iOS 8.1	Android 4.4.2 KitKat	Android 4.4.4 KitKat	Apple iOS 8.1
Screen size/resolution	7in/1280x800	9.7in/2048x1536	8.4in/2560x1600	8in/1920x1200	7.9in/2048x1536
Storage/media card slot	16GB/none	16GB/none	16GB/32GB	16GB/32GB	16GB/none
Connectivity	802.11b/g/n, Bluetooth 4	802.11a/b/g/n/ac, Bluetooth 4	802.11a/b/g/n/ac, Bluetooth 4	802.11a/b/g/n/ac, Bluetooth 4	802.11a/b/g/n, Bluetooth 4
Processor	1.5GHz Snapdragon S4 Pro	Apple A8X	Exynos 5	2.5GHz Snapdragon 801	Apple A7
RAM	2GB	1GB	3GB	3GB	3GB
Claimed battery life	9 hrs	10 hrs	12 hrs	Not specified	Not specified
Cameras (front/rear)	1.2/5Mp	1.28Mp	2.1/8Mp	2.2/8Mp	1.2/8.5Mp
Dimensions	114x200x8.7mm	240x169.5x6.1mm	126x213x6.6mm	123x213x6.4mm	200x134.7x7.5mm
Weight	299g	437g	294g	270g	331g
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/QYUDY5C	TINYURL.COM/QEYQXYM	TINYURL.COM/KL6G9FJ	TINYURL.COM/NJ6VHEO	TINYURL.COM/MZDXBGQ

Tablets

	6 PC ADVISOR RECOMMENDED	7	8 PC ADVISOR RECOMMENDED	9 PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED
	Apple iPad Air	**Google Nexus 9**	**Samsung Galaxy Tab S 10.5**	**Sony Xperia Z2 Tablet**	**Tesco Hudl 2**
Price	**£319 inc VAT**	**£300 inc VAT**	**£399 inc VAT**	**£399 inc VAT**	**£132 inc VAT**
Website	Apple.com/uk	Play.google.com	Samsung.com/uk	Sony.co.uk	Tesco.com
Launch date	Oct 13	Nov 14	Aug 14	Apr 14	Oct 14
Overall rating	★★★★☆	★★★★☆	★★★★½	★★★★½	★★★★½
Platform	Apple iOS 8.1	Android 5.0 Lollipop	Android 4.4.2 KitKat	Android 4.4.2 KitKat	Android 4.4 KitKat
Screen size/resolution	9.7in/2048x1536	8.9in/2048x1536	10.5in/2560x1600	10.1in/1920x1200	8.3in/1920x1200
Storage/media card slot	16GB/none	16GB/32GB	16GB/32GB	16GB/none	16GB/microSD
Connectivity	802.11a/b/g/n, Bluetooth 4	802.11b/g/n/ac, Bluetooth 4.1	802.11b/g/n/ac, Bluetooth 4	802.11b/g/n/ac, Bluetooth 4	802.11a/b/g/n, Bluetooth 4
Processor	Apple A7	2.3GHz nVidia Tegra K1	Exynos 5420	2.3GHz Snapdragon 801	1.8GHz Intel Atom
RAM	1GB	2GB	3GB	3GB	2GB
Claimed battery life	10 hrs	Not specified	Not specified	Not specified	8 hrs
Cameras (front/rear)	1.2/5Mp	1.6/8Mp	2.1/8Mp	2.2/8.1Mp	1.2/5Mp
Dimensions	169x240x7.5mm	228x153x7.95mm	247x177x6.6mm	266x172x6.4mm	128x224x9mm
Weight	469g	425g	465g	439g	401g
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/LSB84EE	TINYURL.COM/NQ6K77Y	TINYURL.COM/OESDFZQ	TINYURL.COM/M8BZZUN	TINYURL.COM/NE5W9U9

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Smartphones	1 PC ADVISOR GOLD	2 PC ADVISOR GOLD	3 PC ADVISOR GOLD	4 PC ADVISOR RECOMMENDED	5
					
	LG G3	**Sony Xperia Z3 Compact**	**LG G2**	**HTC One (M8)**	**Samsung Galaxy Note 4**
Price	**£499 inc VAT**	**£365 inc VAT**	**£279 inc VAT**	**£550 inc VAT**	**£599 inc VAT**
Website	Lg.com/uk	Sonymobile.com	Lg.com/uk	Htc.com/uk	Samsung.com/uk
Launch date	Jun 14	Nov 14	Sep 13	Apr 14	Nov 14
Overall rating	★★★★½	★★★★½	★★★★½	★★★★½	★★★★☆
Platform	Android 4.4.2 KitKat	Android 4.4 KitKat	Android 4.2 Jelly Bean	Android 4.4 KitKat	Android 4.4.4 KitKat
Processor	2.5GHz Snapdragon 801	2.5GHz Qualcomm	2.26GHz Snapdragon 800	2.3GHz Snapdragon 801	2.7GHz Qualcomm
Storage/media card slot	16GB/none	16GB/microSD	16GB/none	16GB/microSD	32GB/none
Screen size/resolution	5.2in/1440x2560	4.6in/1280x720	5.2in/1920x1080	5in/1920x1080	5.7in/2560x1440
Screen type	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch
Connectivity	4G, HSPA+, Bluetooth, Wi-Fi	4G, HSPA+, Bluetooth, Wi-Fi	4G, HSPA+, Bluetooth, Wi-Fi	Bluetooth, NFC, Wi-Fi ac	4G, NFC, Bluetooth, Wi-Fi
Claimed battery life	Not specified	Not specified	Not specified	Not specified	Not specified
Camera (rear)	13Mp, 1080p video	20.7Mp, 1080p video	13Mp, 1080p video	5Mp, 1080p video	8Mp, 1080p video
GPS	A-GPS	A-GPS	A-GPS	A-GPS, Glonass	A-GPS
Dimensions, weight	75x146x8.9mm, 149g	127x64.9x8.6mm, 129g	71x139x9.4mm, 143g	146.4x70.6x9.4mm, 160g	79x154x8.7mm, 175g
Warranty	1 year	1 year	1 year	2 years	Not specified
FULL REVIEW	TINYURL.COM/MQ8DHUU	TINYURL.COM/O6PVRER	TINYURL.COM/PAFK4SZ	TINYURL.COM/NGBWXY9	TINYURL.COM/MRVCQKG

Smartphones	6 PC ADVISOR RECOMMENDED	7 PC ADVISOR RECOMMENDED	8 PC ADVISOR RECOMMENDED	9 PC ADVISOR GOLD	10 PC ADVISOR RECOMMENDED
					
	Huawei Honor 6	**Google Nexus 5**	**Sony Xperia Z3**	**OnePlus One**	**Samsung Galaxy Alpha**
Price	**£249 inc VAT**	**£299 inc VAT**	**£539 inc VAT**	**£229 inc VAT**	**£419 inc VAT**
Website	Huawei.com/uk	Play.google.com	Sonymobile.com	Oneplus.net/uk	Samsung.com/uk
Launch date	Nov 14	Oct 13	Nov 14	Jul 14	Feb 15
Overall rating	★★★★½	★★★★☆	★★★★½	★★★★½	★★★★½
Platform	Android 4.4 KitKat	Android 4.4 KitKat	Android 4.4.4 KitKat	CyanogenMod 11S	Android 4.4.4 KitKat
Processor	1.7GHz Cortex-A15	2.3GHz Snapdragon 800	2.5GHz Qualcomm	2.5GHz Qualcomm	1.8GHz Samsung Exynos
Storage/media card slot	16GB/32GB	16GB/none	16GB/microSD	16GB/none	32GB/microSD
Screen size/resolution	5in/1920x1080	4.95in/1920x1080	5.2in/1920x1080	5.5in/1920x1080	4.7in/1280x720
Screen type	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch	Capacitive multitouch
Connectivity	4G, NFC, Bluetooth, Wi-Fi	HSPA+, Bluetooth, Wi-Fi ac	4G, NFC, Bluetooth, Wi-Fi	4G, NFC, Bluetooth, Wi-Fi	4G, NFC, Bluetooth, Wi-Fi
Claimed battery life	Not specified	17 hrs/300 hrs	Not specified	Not specified	Not specified
Camera (rear)	13Mp, 1080p video	8Mp, 1080p video	20.7Mp, 1080p video	13Mp, 720p video	12Mp, 4K UHD
GPS	A-GPS	A-GPS	A-GPS	Glonass	A-GPS, Glonass
Dimensions, weight	70x140x7.5mm, 130g	69x138x8.9mm, 130g	72x146x7.3mm, 152g	152.9x75.9x8.9mm, 162g	132.4x65.5x6.7mm, 114g
Warranty	1 year	1 year	1 year	Not specified	Not specified
FULL REVIEW	TINYURL.COM/OYBQJVA	TINYURL.COM/PAFK4SZ	TINYURL.COM/K5S4KXD	TINYURL.COM/KYW977U	TINYURL.COM/OYV72VM

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Gaming PCs	1 PC ADVISOR GOLD	2	3	4 PC ADVISOR RECOMMENDED	5
	Chillblast Fusion Probe	Chillblast Fusion Ranger	Gladiator Firestorm OC	CyberPower Infinity Perseus XT	Computer Planet GX 760
Price	£1,299 inc VAT	£1,249 inc VAT	£695 inc VAT	£1,499 inc VAT	£983 inc VAT
Website	Chillblast.com	Chillblast.com	Gladiatorpc.co.uk	Cyberpowersystem.co.uk	Computerplanet.co.uk
Launch date	Feb 14	Jul 14	Mar 14	Feb 14	Mar 14
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★½
Features rating	★★★★½	★★★★☆	★★★½☆	★★★★★	★★★½☆
Performance rating	★★★★½	★★★★½	★★★★☆	★★★★½	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★½	★★★½☆	★★★½☆
Overall rating	★★★★½	★★★★☆	★★★★½	★★★★½	★★★★☆
Processor	3.4GHz Intel Core i5-4670K (OC 4.4GHz)	3.4GHz Intel Core i5-4670K (OC 4.2GHz)	3.4GHz Intel Core i5-4670K (OC 4.2GHz)	3.4GHz Intel Core i5-4670K (OC 4.4GHz)	3.4GHz Intel Core i5-4670K
CPU cooler	Corsair H55 Liquid Cooler	Corsair H60 Liquid Cooler	Be Quiet Dark Rock 3	Cooler Master Seldon 120mm	Corsair H60 Hydro
Memory	16GB DDR3	16GB DDR3	8GB DDR3	16GB DDR3	8GB DDR3
Storage	120GB SSD + 2TB HDD	120GB SSD + 2TB HDD	2TB HDD	256GB SSD + 2TB HDD	120GB SSD + 2TB HDD
Power supply	750W Corsair	750W Corsair	500W Corsair	750W Corsair	450W Corsair
Motherboard	Gigabyte GA-Z87N-Wi-Fi	Asus Maximus VII Ranger	MSI Z87M Gaming	Gigabyte GA-Z87-HD3	Gigabyte GA-Z87N-Wi-Fi
Operating system	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit
Screen	23.6in Iiyama X2377HDS	None supplied	None supplied	23in AOC i2367fh	None supplied
Graphics	Palit Jetstream GeForce GTX 780, 3GB VRAM	PowerColor AMD Radeon R9 290 OC, 4GB VRAM	MSI nVidia GeForce GTX 750 Ti Gaming, 2GB VRAM	Powercolor AMD R9 290, 4GB VRAM	Zotac GeForce GTX 760, 2GB VRAM
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Connectivity	Gigabit ethernet, 802.11n	Gigabit ethernet	Low-lag ethernet	Gigabit ethernet	2x gigabit ethernet, 802.11n
Ports	6x USB 3.0, 4x USB 2.0	6x USB 3.0, 2x USB 2.0, 2x DVI, HDMI, DP	8x USB 3.0, 4x USB 2.0, 2x eSATA	6x USB 3.0, 4x USB 2.0	6x USB 3.0, 2x USB 2.0
Optical drive	DVD±RW (Blu-ray optional)	24x DVD±RW	24x DVD±RW	DVD±RW, BD-ROM	None supplied
Case	Aerocool Dead Silence Gaming Cube	Corsair Graphite 230T	Aerocool Dead Silence Cube Window Red	Cooler Master Dominator 690 III	Fractal Design Node 304
Keyboard & mouse	Gigabyte M6800 mouse, Force K3 keyboard	None	None	Gigabyte M6900 mouse, Force K3 keyboard	None
Other	Optional family pack	None	None	None	None
PC Mark 7 score	6965	6852	5124	6731	5508
Alien vs Predator score (720p/1080p)	169/93fps	173/97	103/54fps	172/96fps	103/54fps
Final Fantasy XIV (720p/1080p)	218/96fps	N/A	N/A	167/87fps	N/A
Sniper Elite V2 (Low/High/Ultra)	308/187/49fps	321/164/42	194/81.6/18.6fps	352/155/39fps	261/119/29fps
Power Consumption	52/407W	67W/386W	70W/166W	68/484W	53W/271W
Warranty	2-year collect-and-return	2-year collect-and-return	4-year return-to-base	3-year RTB (2 years parts, 3 years labour)	3-year return-to-base
FULL REVIEW	TINYURL.COM/OWQ24QQ	TINYURL.COM/MEGK909	TINYURL.COM/PKDV2NG	TINYURL.COM/NKWN7V4	TINYURL.COM/MJZKS7G

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Mini PCs	1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3	4	5
	Yoyotech Warbird RS4.0	Chillblast Fusion Xcalibur	Mesh Elite Mini Gaming OC	Dino PC Microraptor GTX 770	Quiet PC Serenity Nano
Price	**£999 inc VAT**	**£849 inc VAT**	**£1,499 inc VAT**	**£999 inc VAT**	**£1,238 inc VAT**
Website	yoyotech.co.uk	chillblast.com	meshcomputers.com	dinopc.com	quietpc.co.uk
Launch date	Mar 14	Mar 14	Mar 14	Mar 14	Mar 14
Build rating	★★★½☆	★★★☆☆	★★★★☆	★★★½☆	★★★½☆
Features rating	★★★★½	★★★★☆	★★★★½	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★½☆	★★★★★	★★★★☆	★★★★☆
Value rating	★★★½☆	★★★★☆	★★★☆☆	★★★½☆	★★★☆☆
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	3.4GHz Intel Core i5-4670K	3.2GHz Intel Core i5-4570	3.5GHz Intel Core i7-4770K (4.3GHz OC)	3.4GHz Intel Core i5-4670K (4.3GHz OC)	3.4GHz Intel Core i5-4670K (3.8GHz OC)
CPU cooler	Noctua L9i low-profile cooler	Scythe Shuriken low-profile cooler	Corsair Hydro Series H60 liquid cooler	Corsair Hydro Series H80 liquid cooler	Noctua L9i low-profile cooler
RAM	8GB DDR3 1600MHz	8GB DDR3 1600MHz	16GB DDR3 2133MHz	16GB DDR3 1600MHz	16GB DDR3 1600MHz
Storage	128GB SSD, 2TB HDD	120GB SSD, 1TB HDD	240GB SSD, 2TB HDD	128GB SSD, 1TB HDD	120GB SSD, 2TB HDD
Power supply	Seasonic Evo 520W Bronze-rated	450W Silverstone SFX	750W Cooler Master GX RS-750	600W Corsair Builder Series CX600	FSP Aurum 750W modular PSU
Motherboard	Asus Z871-Pro	Asus H811-PLUS	MSI Z871 Gaming AC	Gigabyte GA-Z87N-WIFI	Gigabyte H87N-WIFI
Operating system	Windows 8.1	Windows 8.1/7 Home Premium	Windows 8.1	Windows 8.1	Windows 8.1
Graphics	Asus GTX 770 (2GB)	EVGA GTX 760 (2GB)	AMD Radeon R9 290X (4GB)	Zotac nVidia GeForce GTX 770 (2GB)	Palit GTX 770 Jetstream (2GB)
Networking	Gigabit ethernet, 802.11n Wi-Fi	Gigabit ethernet, 802.11n Wi-Fi	Gigabit ethernet, 802.11n Wi-Fi	2x gigabit ethernet, 802.11n Wi-Fi	Gigabit ethernet, 802.11n Wi-Fi
USB ports	6x USB 3.0, 4x USB 2.0	4x USB 3.0, 4x USB 2.0	6x USB 3.0, 2x USB 2.0	6x USB 3.0, 3x USB 2.0	5x USB 3.0, 4x USB 2.0
Other ports	3x DVI (2x DVI-I), 2x HDMI, 2x DisplayPort	2x DVI, HDMI, DisplayPort	3x DVI, 2x HDMI, 2x DisplayPort, eSATA	1x DVI, 2x HDMI, 1x PS/2	2x DVI, HDMI, DisplayPort
Optical drive	Pioneer BDR-S07XLT Blu-ray writer	Optional	External Blu-ray drive	LiteOn iHAS122 DVD writer	Optional
Case	Cooler Master Elite 130	Silverstone RVZ01	Fractal Design Node 304	Cooler Master Elite 130	Cooler Master Elite 130
Keyboard & mouse	None	Logitech MK520	None	None	None
PCMark 8 score	6403	6334	6678	6861	6403
Alien vs Predator score (720p/1080p)	127/68	104/56	186/104	121/65	127/68
Sniper V2 Elite score (Low/High/Ultra)	303/161/40	263/124/31	387/169/43	313/150/38	303/161/40
Games score (Final Fantasy XIV)	200/76	155/63	183/94	220/81	200/76
Power consumption (idle/max)	49/330W	39/278W	54/548W	71/384W	49/330W
Warranty	3-year Silver (1-year parts, 3-year labour)	2-year collect-and-return (5-year labour)	3-year collect-and-return (2-year parts, 3-year labour)	3-year return-to-base (1-year parts, 3-year labour)	2-year collect-and-return
FULL REVIEW	TINYURL.COM/MQ8POPQ	TINYURL.COM/NFQ6EGO	TINYURL.COM/PWCACV2	TINYURL.COM/MXMJ6QT	TINYURL.COM/O4QDH7Y

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All-in-one PCs	1 PC ADVISOR RECOMMENDED	2	3	4	5
	Apple iMac with 5K display	Acer Aspire AZ3-615	Chillblast Volante AIO	Asus Eee Top	HP Envy Beats 23-n001na
Price	**£1,999 inc VAT**	**£799 inc VAT**	**£1,299 inc VAT**	**£799 inc VAT**	**£900 inc VAT**
Website	Apple.com/uk	Acer.co.uk	Chillblast.com	Asus.com/uk	Hp.com/uk
Launch date	Dec 14	Dec 14	Dec 14	Dec 14	Dec 14
Build rating	★★★★★	★★★½☆	★★★☆☆	★★★½☆	★★★★☆
Features rating	★★★★★	★★½☆☆	★★★★☆	★★★★☆	★★★☆☆
Performance rating	★★★★☆	★★★½☆	★★★★★	★★½☆☆	★★½☆☆
Value rating	★★★★½	★★★★☆	★★★★☆	★★★☆☆	★★★½☆
Overall rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	3.9GHz Intel Core i5-4690	2.7GHz Intel Core i5-4460T	4GHz Intel Core i7-4790S	2.6GHz Intel Core i5-4200U	3.2GHz Intel Core i7-4785T
RAM	8GB DDR3	8GB DDR3	16GB DDR3	6GB DDR3	8GB DDR3
Storage	1TB Fusion Drive	1TB HDD	1TB SSD	1TB HDD	1TB HDD
Screen	27in	23in touchscreen	24in	23in touchscreen	23in touchscreen
Screen resolution	5120x2880	1920x1080	1920x1080	1920x1080	1920x1080
Graphics card	AMD Radeon M9 M290X	nVidia GeForce GT 840M	nVidia GeForce GT 750M	Intel HD Graphics 4400	Intel HD Graphics 4600
Video memory	2GB	2GB	2GB	N/A	N/A
Wireless	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	×	×	×	×	×
USB	4x USB 3.0	2x USB 3.0, 3x USB 2.0	4x USB 3.0, 2x USB 2.0	3x USB 3.0, 3x USB 2.0	2x USB 3.0, 4x USB 2.0
FireWire	×	×	×	×	×
Thunderbolt	✓	×	×	×	×
HDMI	×	×	✓	✓	✓
Media card slot	✓	✓	✓	✓	✓
Optical drive	None	DVD Writer	Blu-Ray Combo	DVD Writer	DVD Writer
Other	Final Cut Pro X, Logic Pro X, Aperture	1Mp webcam, wireless keyboard and mouse	Logitech MK520 wireless keyboard and mouse	2Mp webcam, Freeview TV, wireless keyboard and mouse	Wireless keyboard and mouse, Beats Audio stereo speaker system (8x 12W)
Operating system	OS X Yosemite	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit
Power consumption (idle/max)	46/215W	46/91W	35/177W	33/69W	43/81W
Sniper V2 Elite (Low/High/Ultra)	113.8/84/21.2fps	47.7/18.7/5.1fps	91.5/41.2/10.5fps	31.4/7.8/5fps	27.7/7.4/5fps
PCMark 8 Home score	4008	2906	3776	2828	2702
Dimensions	650x203x516mm	540x489x579mm	585x200x450mm	571x359x50-214mm	563x143x413mm
Weight	9.54kg	8.8kg	14.6kg	9kg	8.4kg
Warranty	1-year return-to-base	Not stated	5-year labour (2-year collect-and-return)	1-year return-to-base	1-year limited parts, labour, and pickup-and-return service
FULL REVIEW	TINYURL.COM/NWJUJSF	TINYURL.COM/QEY8FOE	TINYURL.COM/LO8A5MC	TINYURL.COM/PRPHC7L	TINYURL.COM/O6M4BCN

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Business PCs











	Aria Gladiator Logic N200-3220M	Chillblast Fusion Opal	Wired2Fire Business Accelerate	Dino PC Synergy 4430	Eclipse Precision A856F85
Price	**£509 inc VAT**	**£549 inc VAT**	**£689 inc VAT**	**£569 inc VAT**	**£519 inc VAT**
Website	Aria.co.uk	Chillblast.com	Wired2fire.co.uk	Dinopc.com	Eclipsecomputers.com
Launch date	Aug 13	Aug 13	Aug 13	Aug 13	Aug 13
Build rating	★★★★½	★★★★☆	★★★½☆	★★★★☆	★★★☆☆
Features rating	★★★½☆	★★★½☆	★★★★½	★★★½☆	★★★½☆
Performance rating	★★★½☆	★★★★☆	★★★★½	★★★½☆	★★½☆☆
Value rating	★★★★☆	★★★½☆	★★★☆☆	★★★½☆	★★★½☆
Overall rating	★★★★☆	★★★½☆	★★★½☆	★★★½☆	★★★½☆
Processor	3.3GHz Intel Core i3-3220 (dual-core)	3.2GHz Intel Core i5-4570 (quad-core)	3.4GHz Intel Core i5-4670 (quad-core)	3GHz Intel Core i5-4430 (quad-core)	3.6GHz AMD Trinity A8-5600K (quad-core)
RAM	8GB DDR3	8GB DDR3	8GB DDR3	8GB DDR3	8GB DDR3
Storage	500GB HDD + 80GB SSD	1TB HDD	120GB SSD	1TB HDD	1TB HDD
Motherboard	Gigabyte GA-B75M-D3H	Asus B85M-G	ASRock B85M-HDS	Gigabyte GA-H87M-HD3	Asus F2A85-M LE
CPU cooler	Arctic Cooling Alpine 11 GT Quiet	Standard Intel cooler	Standard Intel cooler	Standard Intel cooler	Standard AMD cooler
Power supply	Corsair 430W	CiT 500W	Xigmatek 400W	CiT 500W	Alpine 600W
Screen	21.5in AOC E2260SWDA	23.6in Iiyama X2377	2x 21.5in AOC E2260SWDA	23in Iiyama XB2380HS-B1	23in AOC i2369Vm
Screen resolution	1920x1080	1920x1080	1920x1080	1920x1080	1920x1080
Graphics	Intel HD Graphics 2500	Intel HD Graphics 4600	Intel HD Graphics 4600	Intel HD Graphics 4600	Integrated
Video memory	N/A	N/A	N/A	N/A	N/A
USB	2x USB 3.0, 4x USB 2.0	3x USB 3.0, 6x USB 2.0	2x USB 3.0, 8x USB 2.0	4x USB 3.0, 4x USB 2.0	4x USB 3.0, 4x USB 2.0
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Speakers	Not specified	Not specified	Not specified	Not specified	Not specified
Case	Cooler Master N200	CiT Fortress	In-Win Em040	CiT Templar	K2 Gamer
Keyboard	Microsoft Desktop 400 keyboard and mouse (wired)	Cherry J82-16001 keyboard, M-5450 mouse (wired)	Gigabyte K6800 keyboard, M6800 mouse (wired)	Logitech K120 keyboard, B110 mouse (wired)	Microsoft Optical Desktop 800 (wired)
Optical drive	24x DVD±RW	24x DVD±RW	DVD±RW	Samsung DVD±RW	Samsung DVD±RW
Operating system	Windows 7 Home Premium 64-bit	Windows 8 Professional	Windows 7 Professional 64-bit	Windows 7 Home Premium 64-bit	Windows 8 Professional
Bundled software	None	None	None	None	None
PCMark 7 overall score	3524	4257	5667	3458	2349
PCMark 7 Productivity score	4056	2685	5929	2529	1883
PCMark 7 Computational score	3321	21490	13651	9377	3899
Power consumption (idle/max)	27/69W	47/124W	37/135W	37/115W	34/145W
Warranty	1-year return-to-base, phone support	2-year collect-and-return, phone support	2-year return-to-base, phone support	3-year return-to-base, phone support	1-year return-to-base, phone support
FULL REVIEW	TINYURL.COM/OSW55A8	TINYURL.COM/KGGE98T	TINYURL.COM/PCSKWVS	TINYURL.COM/PF8LUXD	TINYURL.COM/MQFWJ3R

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- Corsair H55 Liquid Cooler
- Asus Z97I-PLUS WIFI Motherboard
- 16GB 1600MHz DDR3 Memory
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- Corsair CX750M Power Supply
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- Gigabyte M6800 Gaming Mouse

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- Intel® Core™ i5-4690K Processor
- Corsair H55 Liquid Cooler
- Gigabyte Z97-HD3 Motherboard
- 8GB 1600MHz DDR3 Memory
- GeForce GTX 960 2GB GPU
- 1000GB Seagate Hybrid SSHD
- Microsoft Windows 8.1

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Family PCs	1 PC ADVISOR BEST BUY	2	3	4	5
	Chillblast Fusion Commando	Wired2Fire Diablo Reactor	Mesh Elite 4670-PCA	Dino PC Raging Lizard V2	Arbico Family i3 4185
Price	**£799 inc VAT**	**£668 inc VAT**	**£799 inc VAT**	**£780 inc VAT**	**£675 inc VAT**
Website	Chillblast.com	Wired2fire.co.uk	Meshcomputers.com	Dinopc.com	Arbico.co.uk
Launch date	Jul 13	May 14	May 14	May 14	May 14
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★½☆	★★★☆☆
Features rating	★★★★☆	★★★½☆	★★★★½	★★★½☆	★★★☆☆
Performance rating	★★★★½	★★★★½	★★★★½	★★★★☆	★★★☆☆
Value rating	★★★★☆	★★★★½	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★½	★★★★½	★★★★☆	★★★★☆	★★★★☆
Processor	3.2GHz Intel Core i5-4570	3.4GHz Intel Core i5-4670	3.4GHz Intel Core i5-4670	3.5GHz Intel Core i5-4690	3.4GHz Intel Core i3-4130
RAM	16GB DDR3	8GB DDR3 1600MHz	16GB DDR3 1600MHz	8GB DDR3 1600MHz	8GB DDR3 1600MHz
Storage	1TB HDD + 120GB SSD	1TB HDD	2TB HDD + 120GB SSD	1TB HDD + 128GB SSD	1TB HDD + 120GB SSD
Motherboard	Asus B85M-G	Asus B85M-G	MSI B85M-E45	Gigabyte H97M-D3H	MSI B85M-E45
CPU cooler	Arctic Cooling Freezer 7 Pro	Standard Intel Cooler	Standard Intel Cooler	Standard Intel Cooler	Arctic Cooling Freezer 7 Pro
Power supply	600W CiT	500W FSP	500W FSP	500W CIT	650W Arctic Red
Screen	23in Iiyama X2377	24in AOC E2495Sh	24in Iiyama E2483HS-B1	24in Iiyama E2483HS-B1	23.6in AOC E2470SWHE
Screen resolution	1920x1080	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Graphics	Zotac nVidia GeForce GTX 650 Ti	AMD Radeon R7 265	nVidia GeForce GTX 750 Ti	nVidia GeForce GTX 750 Ti	MSI AMD Radeon R7 250
Video memory	N/A	2GB	2GB	2GB	2GB
Connectivity	802.11b/g/n, gigabit ethernet	Gigabit ethernet	Gigabit ethernet	Gigabit ethernet, 802.11b/g/n	Gigabit ethernet
USB	3x USB 3.0, 6x USB 2.0	3x USB 3.0, 6x USB 2.0, 2x HDMI, VGA	4x USB 3.0, 8x USB 2.0, HDMI, VGA, DVI-D, DVI, DP	5x USB 3.0, 3x USB 2.0, 2x HDMI (1x e-Mini), VGA, 2x DVI	2x USB 3.0, 6x USB 2.0, HDMI, VGA, DVI-D
Media card slot	None	None	None	None	None
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Speakers	2x Logitech LS220	None	None	None	None
Case	Cooler Master Force 500	Zalman Z3 Plus	Zalman Z3 Plus	Fractal Design Core 1000 USB3	CIT Templar
Keyboard	Logitech MK260	Octigen Wireless combo	Logitech MK270 (wireless combo)	Gigabyte KM6150 (wired combo)	Logitech MK120
Optical drive	LG BD-ROM/DVD±RW	LiteOn DVD RW	24x DVD RW	None	Samsung DVD RW
Operating system	Windows 8 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit
Bundled software	None	None	None	None	Ahead Nero, CyberLink PowerDVD
Sniper V2 Elite score (Low/High/Ultra)	147/59/14fps	240/76/18fps	195/68/16fps	196/83/20fps	62/22/5fps
Alien vs Predator score (720p/1080p)	52/27fps	83/44fps	71/37fps	102/53fps	22/11fps
PCMark 7 score	6177	3938	7304	6431	4800
Warranty	2-year collect-and-return	2-year return-to-base	3-years labour (2-year parts, 3-months free C&R)	3-year labour (2-year parts)	2-year return-to-base
FULL REVIEW	TINYURL.COM/KF6G3T7	TINYURL.COM/OA8UKDP	TINYURL.COM/OZCSHYU	TINYURL.COM/PFA55F7	TINYURL.COM/NU7FSGB

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Sub-£150 printers

	1	2	3	4	5
		 PC ADVISOR RECOMMENDED			
	Samsung Xpress M2070W	**Canon Pixma MG5550**	**Samsung Xpress M2022W**	**Canon Pixma MX535**	**Brother MFC-J870DW**
Price	**£100 inc VAT**	**£60 inc VAT**	**£68 inc VAT**	**£70 inc VAT**	**£120 inc VAT**
Website	Samsung.com/uk	Canon.co.uk	Samsung.com/uk	Canon.co.uk	Brother.co.uk
Launch date	Mar 14	Apr 14	Aug 14	Jul 14	Jul 14
Overall rating	★★★★½	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Technology	Mono laser	Colour inkjet	Mono laser	Colour inkjet	Colour inkjet
Max print resolution	1200x1200	4800x1200dpi	1200x1200dpi	4800x1200dpi	6000x1200dpi
Actual print speed	B=17.1ppm	B=11.8ppm C=8.7ppm	B=18ppm	B=9.7ppm C=3.8ppm	B=18ppm C=11ppm
Scan/fax facilities	1200x1200 scans	1200x2400 scans	None	1200x2400 scans/fax	1200x2400 scans
Supported interfaces	USB 2.0, 802.11b/g/n, NFC	USB 2.0, 802.11b/g/n	USB 2.0, 802.11b/g/n	USB 2.0, 802.11b/g/n, AirPrint	USB 2.0, 802.11b/g/n, NFC
Cost per page	B=3.8p	B=2.4p C=4.8p	B=5p	B=2.7p C=4.8p	B=3.9p C=2.5p
Media card/auto duplex	××	×✓	××	×✓	✓✓
Input capacity	150 sheets	100 sheets	150 sheets	100 sheets + 30-sheet ADF	150 sheets + 20 ADF
Dimensions	406x360x253mm	455x369x148mm	332x215x178mm	458x385x200mm	410x374x180mm
Weight	7.4kg	6.3kg	4kg	8.5kg	9.5kg
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/OYZKJKE	TINYURL.COM/LKWLJDE	TINYURL.COM/NFJHDOR	TINYURL.COM/N9LXVN7	TINYURL.COM/M52V29R

£151+ printers

	1	2	3	4	5
				 PC ADVISOR GOLD	
	Canon i-Sensys MF6180dw	**Epson Ecotank L555**	**Brother HL-L9200CDWT**	**HP OfficeJet Pro X551dw**	**Kyocera Ecosys P6030cdn**
Price	**£320 inc VAT**	**£330 inc VAT**	**£548 inc VAT**	**£275 inc VAT**	**£546 inc VAT**
Website	Canon.co.uk	Epson.co.uk	Brother.co.uk	Hp.com/uk	Kyoceradocumentsolutions.co.uk
Launch date	May 14	Jan 15	Aug 14	Aug 13	Jul 14
Overall rating	★★★★½	★★★★☆	★★★★½	★★★★½	★★★★☆
Technology	Mono laser	Colour inkjet	Colour laser	Colour inkjet	Colour laser
Max print resolution	1200x600dpi	5760x1440dpi	2400x600dpi	2400x2400	9600x600dpi
Actual print speed	B=24ppm	B=8.5ppm C=4ppm	B=30ppm C=30ppm	B=42.9ppm C=15.8ppm	B=27ppm C=27ppm
Scan/fax facilities	600dpi scanner, 33.6Kb/s fax	1200dpi scanner, 33.6Kb/s fax	None	None	None
Supported interfaces	USB 2.0, ethernet, 802.11b/g/n	USB 2.0, 802.11b/g/n	USB 2.0, ethernet, 802.11b/g/n	USB 2.0, ethernet, 802.11b/g/n	USB 2.0
Cost per page	B=1.5p	B=0.2p C=0.4p	B=1p C=5.9p	B=1p C=4.3p	B=1.2p C=1.7p
Media card/auto duplex	×✓	××	×✓	×✓	×✓
Input capacity	250 + 50 sheet + 50 ADF	100 + 30 sheet	750 sheets + 50 sheet	500 + 50 sheet	500 sheets + 150 (2150 max)
Dimensions	390x473x431mm	474x377x226mm	410x495x445mm	517x399x414mm	345x518x480mm
Weight	19.1kg	6.2kg	28.3kg	17.1kg	29.5kg
Warranty	1 year	1 year	1 year	1 year	2 years
FULL REVIEW	TINYURL.COM/LE9WA5N	TINYURL.COM/N8NS5QL	TINYURL.COM/PT52MH6	TINYURL.COM/CZO5P65	TINYURL.COM/N4MCYLF

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Blu-ray drives



	1 Pioneer BDR-209EBK Retail	2 Pioneer BDR-209DBK OEM	3 LG LN48919	4 LG BP40NS20	5 Lite-On IHES112-115
Price	**£59 inc VAT**	**£54 inc VAT**	**£60 inc VAT**	**£90 inc VAT**	**£54 inc VAT**
Website	Pioneer.eu/uk	Pioneer.eu/uk	Uk.lge.com	Uk.lge.com	Liteonit.eu
Launch date	Nov 13	Nov 13	May 12	Jan 13	Oct 12
Overall rating	★★★★½	★★★★½	★★★★½	★★★★☆	★★★½☆
Blu-ray speeds	16x -R, 14x -R DL, 2x -RE, 12x -ROM	16x -R, 14x -R DL, 2x -RE, 12x -ROM	16x -R, 12x -R DL, 12x -RE, 12x -ROM	6x -R, 6x -R DL, 2x -RE, 6x -ROM	12x -ROM
DVD speeds	16x ±R, 8x ±R DL, 6x -RW, 8x +RW, 16x -ROM	16x ±R, 8x ±R DL, 6x -RW, 8x +RW, 16x -ROM	16x ±R, 8x ±R DL, 6x -RW, 8x +RW, 12x -RAM, 16x -ROM	8x ±R, 6x ±R DL, 6x -RW, 8x +RW, 5x -RAM, 8x -ROM	8x ±R, 8x ±R DL, 6x -RW, 8x +RW, 8x -ROM
Max storage	128GB	50GB	50GB	100GB	8.5GB
Interface type	SATA (internal)	SATA (internal)	SATA (internal)	USB 2.0 (external)	SATA (internal)
Label technology	None	None	LightScribe	None	None
Software	ArcSoft TotalMedia Extreme	None	CyberLink Blu-ray Suite	PowerDVD, PowerProducer	None
Dimensions	148x180x42mm	148x180x42mm	146x170x41mm	160x153x22mm	158x145x22mm
Weight	740g	740g	749g	380g	700g
Warranty	1 year	1 year	1 year	1 year	2 years
FULL REVIEW	TINYURL.COM/LD47X7K	TINYURL.COM/LD47X7K	TINYURL.COM/8YTUJEF	TINYURL.COM/BS8UAFF	TINYURL.COM/8SYECMW

Wireless routers



	1 Apple AirPort Extreme	2 Netgear Nighthawk R7000	3 D-Link DIR 880L	4 TP-Link Archer C7	5 Asus RT-AC68U AC1900
Price	**£169 inc VAT**	**£150 inc VAT**	**£108 inc VAT**	**£90 inc VAT**	**£160 inc VAT**
Website	Apple.com/uk	Netgear.co.uk	Dlink.com	Tp-link.com	Uk.asus.com
Launch date	Jan 14	Sep 14	Sep 14	Jan 14	Jan 14
Overall rating	★★★★☆	★★★★½	★★★★☆	★★★★☆	★★★★☆
Standards supported	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac
Frequency modes	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)
Antennas	6x internal	3x external	3x external	3x external, 3x internal	3x external, 3x internal
Built-in modem	×	×	×	×	×
Manufacturer's rating	1300/450Mb/s	1300/600Mb/s	1300/600Mb/s	1300/450Mb/s	1300/600Mb/s
WPS	×	✓	✓	✓	✓
Ports	Gigabit WAN, 3x gigabit LAN, USB	Gigabit WAN, 1x USB 3.0, 1x USB 2.0	Gigabit WAN, 1x USB 3.0, 1x USB 2.0	Gigabit WAN, 4x gigabit LAN, 2x USB 2.0	Gigabit WAN, 4x gigabit LAN, 2x USB 2.0
Average power use	8W	9W	10W	N/A	N/A
Max speed (11n/11ac)	171/572Mb/s	171/592Mb/s	171/625Mb/s	110/505Mb/s	98/610Mb/s
Dimensions, weight	98x168x98mm, 945g	285x186x45mm, 750g	247x190x47mm, 745g	32.5x243x160mm, 508g	160x83x220mm, 640g
Warranty	1 year	N/S	N/S	3 years	2 years
FULL REVIEW	TINYURL.COM/MFDLLSC	TINYURL.COM/Q2NR8Q	TINYURL.COM/OZ5G7KG	TINYURL.COM/KKJMPCE	TINYURL.COM/K4ZATKV

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NAS drives











	Qnap TS-421	Synology DS115j	Qnap HS-210	Synology DS414j	Western Digital Red 6TB
Price	**£320 inc VAT (diskless)**	**£83 inc VAT (diskless)**	**£190 inc VAT (diskless)**	**£270 inc VAT (diskless)**	**£220 inc VAT (diskless)**
Website	Qnap.com	Synology.com	Qnap.com	Synology.com	Wdc.com
Launch date	Mar 14	Feb 15	Dec 14	Jan 15	Jan 15
Overall rating	★★★★☆	★★★★☆	★★★★½	★★★★☆	★★★★½
Drive bays	4	1	2	4	1
Processor	2GHz Marvell single-core	800MHz Marvell Armada 370	1.6GHz Marvell single-core	1.2GHz Mindspeed Concerto	N/A
Memory	1GB DDR3	256MB DDR3	512MB DDR3	512MB DDR3	64MB
Remote access	✓	✓	✓	✓	✓
eSATA	2x	×	×	1x	×
USB port	2x USB 3.0, 2x USB 2.0	2x USB 2.0	2x USB 3.0, 2x USB 2.0	1x USB 3.0, 1x USB 2.0	n/a
Raid options	0/1/5/6/10/JBOD	None	0/1/JBOD	0/1/5/6/10/JBOD	n/a
Software	Backup Station	DSM 5.1	HD Station	DSM 5.0	NASware
Dimensions	177x180x235mm	71x161x224mm	302x220x41mm	184x168x230mm	147x102x26mm
Weight	3kg	700g	1.5kg	2.2kg	750g
Warranty	2 years	1 year	2 years	3 years	3 years
FULL REVIEW	TINYURL.COM/MCYWUB8	TINYURL.COM/MNEYVNK	TINYURL.COM/OEXRYNY	TINYURL.COM/M643BSG	TINYURL.COM/NBDGM5W

USB drives











	Transcend StoreJet 25M3	Toshiba Canvio Basics	WD My Passport Ultra Metal	Seagate Seven mm	iStorage diskAshur Pro
Price	**£70 inc VAT**	**£76 inc VAT**	**£90 inc VAT**	**£99 inc VAT**	**£269 inc VAT**
Website	Uk.transcend-info.com	Toshiba.co.uk	Wdc.com/en	Seagate.com/gb/en	Istorage-uk.com
Launch date	Feb 15	Feb 15	Feb 15	Feb 15	Feb 15
Overall rating	★★★★½	★★★★☆	★★★★☆	★★★★☆	★★★½☆
Capacity tested	2TB	2TB	2TB	500GB	1TB
Capacity range	500GB, 1TB, 2TB	500GB, 1TB, 2TB	1TB, 2TB	500GB	500GB, 1TB, 1.5TB, 2TB
Disk size	2.5in	2.5in	2.5in	2.5in	2.5in
Spin speed	5400rpm	5400rpm	N/A	5400rpm	5400rpm
Transfer speed	135MB/s	117MB/s	114MB/s	49MB/s	115MB/s
Encryption	256-bit AES	256-bit AES	256-bit AES	N/A	256bit AES-XTS
Other interfaces	USB 3.0	USB 3.0	USB 3.0	USB 3.0	USB 3.0
Software	Transcend Elite	None	WD Drive Utilities	Seagate Dashboard	Security utilities
Dimensions	130x82x19mm	111x79x21mm	110x80x19mm	123x82x7mm	120x85x20mm
Weight	234g	207g	241g	178g	200g
Warranty	3 years	2 years	3 years	2 years	2 years
FULL REVIEW	TINYURL.COM/M72D3EP	TINYURL.COM/JWHHACB	TINYURL.COM/L2B7V3B	TINYURL.COM/O6KZFDM	TINYURL.COM/MZOBZ6J

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SSDs







	1 Crucial M550	2 OCZ Vector 150	3 Crucial M500	4 Samsung 840 EVO	5 Seagate 600 SSD
Price	**£338 inc VAT**	**£125 inc VAT**	**£155 inc VAT**	**£320 inc VAT**	**£202 inc VAT**
Website	Crucial.com/uk	Ocz.com	Crucial.com/uk	Samsung.com/uk	Seagate.com/gb
Launch date	May 14	May 14	Aug 13	Nov 13	May 14
Overall rating	★★★★½	★★★★☆	★★★★½	★★★★½	★★★★☆
Capacity tested	1TB	240GB	480GB	750GB	480GB
Price per GB	34p	52p	32p	43p	43p
Memory cache	1GB LP DDR2	512MB	512MB DDR3	1GB LPDDR2	N/A
Controller	Marvell 88SS9189	Indilinx Barefoot 3 M00	Marvell 88SS9187	Samsung MEX (3-core ARM)	Link A Media Device
Encryption	AES 256-bit	AES 256-bit	AES 256-bit	AES 256-bit	None
Flash	Micron 20nm MLC NAND	Toshiba 19nm MLC	Micron 20nm MLC NAND	Samsung 19nm Toggle NAND	Toshiba 19nm MLC
Firmware updated via	Bootable CD	OCZ Toolbox, bootable	ISO boot disc	SSD Magician for Windows	Seagate Firmware, bootable
ATTO peak sequential	R: 563MB/s; W: 514MB/s	R: 557MB/s; W: 534MB/s	R: 539MB/s; W: 433MB/s	R: 554MB/s; W: 537MB/s	R: 555MB/s; W: 474MB/s
CDM peak IOPS	100 / 91.7	92.9 / 94.7	89.8k (read)	104K (read)	96.8 / 88.6
CDM 4kB rnd	30/99	25/97	N/A	N/A	28/78
Warranty	3 years	5 years or 91TB writes	3 years	5 years	3 years
FULL REVIEW	TINYURL.COM/MSWD98Z	TINYURL.COM/KBED2W6	TINYURL.COM/M2NCSMJ	TINYURL.COM/L5EDQOY	TINYURL.COM/N58RB8G

Projectors







	1 ViewSonic PLED-W800	2 BenQ W1300	3 Optoma W316	4 InFocus IN126STa	5 NEC M352WS
Price	**£512 inc VAT**	**£730 inc VAT**	**£458 inc VAT**	**£525 inc VAT**	**£778 inc VAT**
Website	Viewsoniceurope.com/uk	Benq.co.uk	Optoma.co.uk	Infocus.com	Nec-display-solutions.com
Launch date	Feb 15	Jun 14	Jul 14	Sep 14	Jul 14
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Projection technology	DLP	DLP	DLP	DLP	DLP
Resolution (pixels)	1280x800	1920x1080	1280x800	1280x800	1280x800
Brightness, Contrast	800, 120,000:1	2000, 10,000:1	3400, 15,000:1	3300, 15,000:1	3500, 10,000:1
Image size	100in	300in	300in	300in	150in
Supported aspect ratios	16:10 native	16:9 native	16:10, 16:9, 4:3	16:10, 16:9, 4:3	16:10
Noise levels (dB)	34 (32 eco)	33 (30 eco)	29db	32db (30 eco)	33 (39 bright mode)
Connections	VGA, HDMI, USB	VGA, 2x HDMI, USB, 3D	VGA, HDMI, Mini-USB, 3D	2x VGA, HDMI, USB, ethernet	2x VGA, 2x HDMI, USB
Lamp/lamp life	90W/30000 hrs	240W/6000 hrs	190W/10000 hrs	278W/3500 hrs	278W/8000 hrs
Dimensions	175x52x138mm	330x257x128mm	315x223x102mm	292x220x108mm	368x268x97mm
Weight	0.83kg	3.4kg	2.5kg	3.7kg	3.6kg
Warranty	3 years	3 years	2 years	1 year	3 years
FULL REVIEW	TINYURL.COM/K83X8LA	TINYURL.COM/K4FA89Q	TINYURL.COM/OCWTHGW	TINYURL.COM/NHH3QPB	TINYURL.COM/Q6J2N6W

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Sub-£150 graphics cards











	MSI Radeon R9 270X	MSI Radeon R9 270 Gaming Ed	MSI R7 260X OC	XFX Radeon R7-265	Gigabyte GTX 750 Ti
Price	**£130 inc VAT**	**£125 inc VAT**	**£91 inc VAT**	**£110 inc VAT**	**£120 inc VAT**
Website	Uk.msi.com	Uk.msi.com	Uk.msi.com	Sapphiretech.com	Uk.gigabyte.com
Launch date	Dec 13	Jul 14	May 14	Sep 14	Aug 14
Overall rating	★★★★☆	★★★★½	★★★½☆	★★★★☆	★★★½☆
Graphics processor	AMD Radeon R9 270X	AMD Radeon R9 270	AMD Radeon R7 260X	AMD Radeon R7 265	nVidia GeForce GTX 750 Ti
Installed RAM	2GB GDDR5	2GB GDDR5	2GB GDDR5	2GB GDDR5	2GB GDDR5
Memory interface	256-bit	256-bit	128-bit	128-bit	128-bit
Core clock/boost	1030MHz/1120MHz	900MHz/975MHz	1175MHz/none	900MHz/925MHz	1033MHz/1111MHz
Memory clock/Effective	1.4GHz/5.6GHz	1.4GHz/5.6GHz	1625MHz/6.5GHz	1.4GHz/5.6GHz	1.35GHz/5.4GHz
Stream processors	1280	1280	896	Varies	640
Texture units	80	80	56	64	40
Power connectors	2x 6-pin	1x 6-pin	1x 6-pin	1x 6-pin	N/A
DirectX	11	11.2	11.1	11	11.2
Digital interface	2x DVI, HDMI, DisplayPort	2x DVI, HDMI, DP	2x DVI, HDMI, Mini-DP	2x DVI, 1x HDMI, 1x DP	2x DVI, 2x HDMI
Warranty	2 years	3 years	3 years	2 years	3 years
FULL REVIEW	TINYURL.COM/OYA2DFJ	TINYURL.COM/MCE7353	TINYURL.COM/OZ6WUYT	TINYURL.COM/LV69BEM	TINYURL.COM/Q7K4ESV

£151+ graphics cards







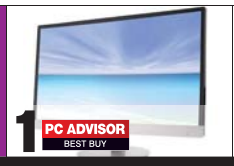




	Gigabyte GeForce GTX 770 2GB	Sapphire Radeon R9 280X	XFX Radeon R9 290X	MSI Radeon R9 270X	MSI Radeon R9 295 X2
Price	**£200 inc VAT**	**£200 inc VAT**	**£280 inc VAT**	**£150 inc VAT**	**£680 inc VAT**
Website	Uk.gigabyte.com	Sapphiretech.com	Xfxforce.com	Uk.msi.com	Uk.msi.com
Launch date	Aug 13	Mar 14	Apr 14	Dec 13	May 14
Overall rating	★★★★½	★★★★½	★★★★½	★★★★☆	★★★★☆
Graphics processor	nVidia GeForce GTX 770	AMD Radeon R9 280X	AMD Radeon R9 290X	AMD Radeon R9 270X	AMD Radeon R9 295 X2
Installed RAM	2GB GDDR5	3GB GDDR5	4GB GDDR5	2GB GDDR5	8GB GDDR5
Memory interface	256-bit	384-bit	512-bit	256-bit	2x 512-bit
Core clock/boost	950MHz/1020MHz	950MHz/1070MHz	1GHz/1GHz	1030MHz/1120MHz	1018MHz/N/A
Memory clock/Effective	1.5GHz/6GHz	1.55GHz/6.2GHz	1.25GHz/5GHz	1.4GHz/5.6GHz	1.25GHz/5GHz
Stream processors	1536	2048	2816	1280	2x 2816
Texture units	128	128	176	80	2x 176
Power connectors	1x 6-pin, 1x 8-pin	2x 8-pin	8-pin, 6-pin	2x 6-pin	2x 8-pin
DirectX	11	11	11	11	11
Digital interface	2x DVI, HDMI, DisplayPort	DVI, HDMI, 2x Mini-DisplayPort	2x DVI, HDMI, DisplayPort	2x DVI, HDMI, DisplayPort	DVI, 4x Mini-DP
Warranty	3 years	2 years	3 years	2 years	3 years
FULL REVIEW	TINYURL.COM/OAG6277	TINYURL.COM/OWVAP37	TINYURL.COM/NPET8ER	TINYURL.COM/OYA2DFJ	TINYURL.COM/POTAOGZ

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Sub-£200 flat-panel displays











	AOC i2369Vm	Philips 234E5QHAW	NEC MultiSync E243WMi	BenQ EW2740L	BenQ GL2450
Price	**£130 inc VAT**	**£130 inc VAT**	**£194 inc VAT**	**£175 inc VAT**	**£108 inc VAT**
Website	Aoc-europe.com/en	Philips.co.uk	Nec-display-solutions.com	Benq.co.uk	Benq.co.uk
Launch date	Jul 14	Jul 14	Jun 14	Aug 14	Jul 14
Overall rating	★★★★½	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Screen size	23in	23in	23.8in	27in	24in
Panel type	IPS matt	IPS matt	IPS matt	VA semi-matt	TN matt
Native resolution	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Pixel density	96ppi	96ppi	93ppi	82ppi	92ppi
Brightness	220cd/m²	187cd/m²	250cd/m²	300cd/m²	261cd/m²
Static contrast ratio	630:1	210:1	650:1	280:1	610:1
Response time	6ms	5ms	6ms	4ms	5ms
Ports	HDMI, HDMI/MHL, DP, VGA	2x HDMI (QHAB) or 1x HDMI (QDAB), VGA	DP, DVI-D, VGA	2x HDMI, VGA	DVI-D, VGA
Dimensions	531x204x398mm	532x213x414mm	558x214x380-490mm	623x191x451mm	579x179x436mm
Weight	3.75kg	3.5kg	6.3kg	4.2kg	4.1kg
Warranty	3 years	2 years	3 years	2 years	2 years
FULL REVIEW	TINYURL.COM/OOEFYPR	TINYURL.COM/KLYLW4V	TINYURL.COM/KNCGVOU	TINYURL.COM/OO6EC5L	TINYURL.COM/OOUPFUE

£201+ flat-panel displays











	LG 34UM95	HP DreamColor Z27x	Dell UltraSharp 32 Ultra	BenQ PG2401PT	ViewSonic VP2772
Price	**£760 inc VAT**	**£750 inc VAT**	**£1,455 inc VAT**	**£855 inc VAT**	**£540 inc VAT**
Website	Lg.com/uk	hp.com/uk	Dell.co.uk	Benq.co.uk	Viewsoniceurope.com/uk
Launch date	Dec 14	Jan 15	Jun 14	Oct 14	Jun 14
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★½☆
Screen size	34in 21:9	27in	31.5in	24.1in	27in
Panel type	IPS matt	AH-IPS	IGZO	IPS	AH-IPS
Native resolution	3440x1440	2560x1440 pixels	3840x2160 pixels	1920x1200 pixels	2560x1440 pixels
Pixel density	110ppi	109ppi	140ppi	94ppi	109ppi
Brightness	320cd/m²	250cd/m²	350cd/m²	317cd/m²	350cd/m²
Static contrast ratio	1000:1	800:1	550:1	540:1	560:1
Response time	5ms	7ms	8ms	5ms	6ms
Ports	HDMI, DP, Thunderbolt, USB 3.0	HDMI, DP, USB 3.0, USB 2.0	HDMI, DP, Mini-DP, 4x USB 3.0	DVI, DP, HDMI, VGA, 3x USB 3.0	HDMI, DVI, Mini-DP, 4x USB 3.0
Dimensions	830x83x380mm	641x655x379mm	750x214x483-572mm	543x254x555mm	643x348x470mm
Weight	6.7kg	8.8kg	9.2kg	7kg	8.5kg
Warranty	2 years	3 years	3 years	1 year	3 years
FULL REVIEW	TINYURL.COM/QYKH6UM	TINYURL.COM/NKUF9EN	TINYURL.COM/O4CTO3S	TINYURL.COM/PMV5L5V	TINYURL.COM/LLQRWTX

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SIMON JARY



Falling out of love

There's no doubt that in its five years of existence Apple's iPad has revolutionised personal computing. It just hasn't revolutionised mine. I really did think it would, but it hasn't. In fact, I hardly ever use it any more.

Everyone wanted one. But how many people still use it that much? I was an early iPad adopter, and even upgraded to a model with a Retina display. But my iPad lies mostly unused in the tech drawer at home – with the wired headphones, Apple TV and viper's nest of USB cables and adaptors.

When the iPad was born my daughter was approaching three, and ripe for the many apps that soon begged to be downloaded. She was an eager user, and I followed suit, downloading apps and playing games with her. But over time she asked for the iPad less and less, preferring, as I do, the convenience of the iPhone, which is more likely to be around or indeed charged.

I never really got into reading newspapers and magazines on the tablet. The few situations I have for reading periodicals fall out of the iPad's reach.

The apps that once bonded my daughter and me to the iPad are pretty much all available on the iPhone. There are exceptions where the iPad's larger screen does justice to the apps: Let's Create Pottery and Spy Mouse, for example. Even the expansive world of Minecraft works fine on an iPhone 6.

Of course, most games and photos look better on the larger screen. But how often do you put your phone aside to get out the iPad to take advantage of that 9.7in screen? And shoot me if you ever see me outside taking a photo with one.

One game that demands the iPad is the wonderful Osmo, which actually moved the tablet on to another level of game play. If there were more apps like Osmo and my iPad would leave the cupboard more often.

But for everyday personal computing, the phone and a laptop will do just fine: email, web browsing, Facebook, sports results, news sites, Google, Wikipedia, Excel, Word, Calendar, iTunes, and so on all aren't made greater on an iPad. Often they're better on a smaller screen. That big slab in between doesn't get a look in much any more – unless you don't have a smartphone or laptop, and who doesn't these days?

Sure, the iPad works for some things: commuters watching movies and TV shows. FaceTime maybe, but that's more convenient on an iPhone, I'd argue. Bigger screen = better, unless you have to hold it too long and wear out your arms.

The fact remains that in my house the iPad is rarely seen. My daughter, now eight, is no screenaphobe. She'll happily sit in front of our iMac or MacBook Air coding all day (tablets are better at consumption than creation) or watching clips of *Horrible Histories*. But only when she tires of such things might she enquire about the whereabouts of the iPad.

If he was still with us, I wonder if Steve Jobs would agree with himself (which he mostly did) when a few years before he revealed the iPad, he said that a tablet can't do much more than an iPhone can.

Apple sold 300,000 iPads on its day of release, and a staggering 18 million in its first year. Total worldwide sales of the iPad are now in the region of 256 million. But, while still buoyant, iPad sales have declined over 20 percent since this time last year. Last October they dropped 13 percent. The quarter before they'd fallen 16 percent. Indeed, sales of all tablets (iPads and Android) fell nearly 10 percent in the final quarter of 2014.

Apart from speed – and much improved free versions of iOS – the iPad hasn't really changed at all in five years. I haven't been tempted by a Retina display iPad. It's just a nicer screen. If my current iPad's display was rubbish I might have been tempted to upgrade, but it's just fine for me. There are no other new features in the hardware. You can't say the same about the latest iPhones, with their larger screens that have proved wildly popular.

> **"Apart from speed – and much improved free versions of iOS – the iPad hasn't really changed at all in five years"**

Another reason that iPhones are upgraded more often than iPads is the way that we basically rent them through carrier Pay Monthly deals. These mostly run out every two years, just in time for a 'cheap' upgrade to the latest model.

The iPad is a beautiful but largely pointless thing. Happy Birthday to you! As a treat, I'll get you out of the drawer tonight and see if you have enough charge for a play. ☒



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- 4 x USB ports

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